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Historical Electromagnetic Propagation Condition Database Description

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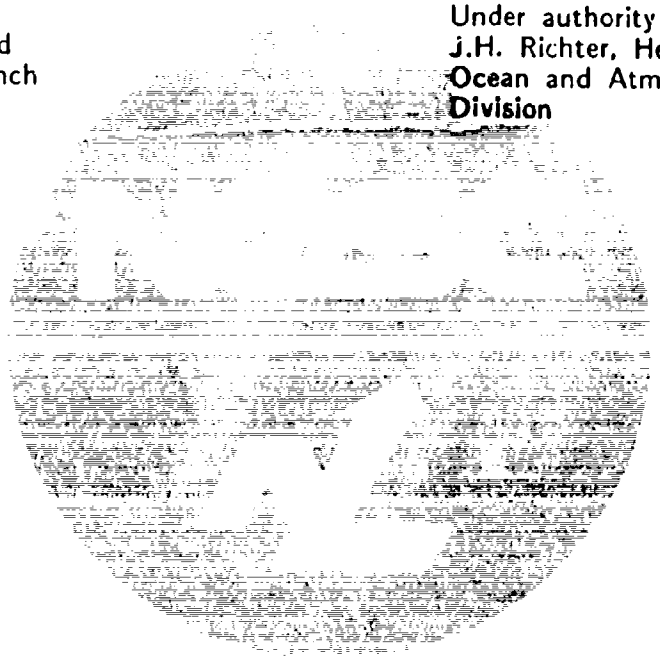

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SECTION 1

PURPOSE

The purpose of this report is to describe an electromagnetic propagation conditions climatological database, a subset of which is employed by the Historical Electromagnetic Propagation Conditions Summary Function (HEPC) within the Tactical Environmental Support System (TESS) (reference 1).

BACKGROUND

The HEPC function generates a climatological description of the refractive conditions for a user-specified geographic location. The climatological description is composed of five parts:

- a percent occurrence of enhanced surface-to-surface radar detection, electronic support measures (EMS) intercept and communications range
- a surface-based duct summary
- an elevated duct summary
- an evaporation duct histogram
- a general meteorology summary.

Figure 1 illustrates the description.

The statistics displayed by the HEPC function are derived from two meteorological databases, the Radiosonde Data Analysis II assembled by the GTE Sylvania Corporation and the Duct63 assembled by the National Climatic Data Center. Prior to the discussion of the HEPC database construction, it is appropriate to describe these two sources of data.

HISTORICAL PROPAGATION CONDITIONS SUMMARY

Specified location: 20.00 N 130.00 W MS = 86 (* = Insufficient data)
Radiosonde source: 30.00 N 140.00 W MS = 123 WMO number = 4YN
Coastal station: FIXED SHIP, NORTH PACIFIC OCEAN Hgt = 12 m
Surface observation source: 25.00 N 125.00 W MS = 85

Percent occurrence of enhanced surface-to-surface radar/esm/com ranges:

Frequency	Average day	Average nite	Average d&n	Jan day	Jan nite	Jan d&n	Feb day	Feb nite	Feb d&n	Mar day	Mar nite	Mar d&n
100 Mhz	3	<1	2	3	<1	2	4	<1	2	3	<1	2
1 GHz	12	3	7	11	3	7	14	2	8	10	4	7
3 GHz	17	4	11	16	4	10	21	3	12	15	6	11
6 GHz	47	26	37	45	26	36	49	24	37	47	29	38
10 GHz	71	55	64	70	55	62	72	52	63	73	58	66
20 GHz	90	83	87	88	82	85	90	82	86	91	85	88

Surface based duct summary:

Parameter	Average day	Average nite	Average d&n	Jan day	Jan nite	Jan d&n	Feb day	Feb nite	Feb d&n	Mar day	Mar nite	Mar d&n
Percent occurrence	22	5	13	19	5	12	28	3	16	18	7	13
Avg thickness Km			.09			.09			.09			.09
Avg trap freq GHz			.81			.73			.96			.75
Avg 1yr grad -N/Km			225			227			220			227

Elevated duct summary:

Parameter	Average day	Average nite	Average d&n	Jan day	Jan nite	Jan d&n	Feb day	Feb nite	Feb d&n	Mar day	Mar nite	Mar d&n
Percent occurrence	38	57	48	42	56	49	37	53	45	36	61	49
Avg duct top Km			1.6			1.4			1.6			1.7
Avg thickness Km			.17			.18			.17			.17
Avg trap freq GHz			.20			.21			.19			.20
Avg 1yr grad -N/Km			222			215			218			233
Avg 1yr base Km			1.5			1.3			1.5			1.6

Evaporation duct histogram in percent occurrence.

Percent Occurrence	Average day	Average nite	Average d&n	Jan day	Jan nite	Jan d&n	Feb day	Feb nite	Feb d&n	Mar day	Mar nite	Mar d&n
0 to 4 Meters	4	5	5	5	5	5	4	5	5	4	4	4
4 to 8 Meters	11	18	15	13	18	16	12	18	15	9	17	13
8 to 12 Meters	26	33	30	26	32	29	28	34	31	26	33	29
12 to 16 Meters	30	29	30	30	29	30	30	27	28	31	30	31
16 to 20 Meters	19	12	16	19	12	15	17	11	14	20	14	17
20 to 24 Meters	7	3	5	6	3	5	7	3	5	7	2	5
24 to 28 Meters	1	<1	1	1	<1	<1	2	<1	1	2	<1	1
28 to 32 Meters	<1	<1	<1	<1	0	<1	<1	<1	<1	<1	<1	<1
32 to 36 Meters	<1	<1	<1	0	0	0	<1	0	<1	<1	<1	<1
36 to 40 Meters	0	0	0	0	0	0	0	0	0	0	0	0
above 40 Meters	0	<1	<1	0	<1	<1	0	0	0	0	0	0
Mean height Meters	13	11	12	13	11	12	13	11	12	13	12	13
# of observations	2k	2k	2k	2k	2k	2k	2k	2k	2k	2k	2k	2k

General meteorology summary:

Parameter	Average day	Average nite	Average d&n	Jan day	Jan nite	Jan d&n	Feb day	Feb nite	Feb d&n	Mar day	Mar nite	Mar d&n
# Accepted soundings	120	120	120	116	120	118	115	112	114	129	127	128
% occur EL&SB dcts			3			3			3			2
% occur 2+ EL dcts			3			5			3			2
Avg station N			339			343			337			337
Avg station -N/Km			48			50			48			45
Avg sfc wind m/s	7	7	7	7	7	7	7	7	7	7	7	7

Figure 1. HEPC Function output for metric units.

SECTION 2

GTE SYLVANIA RADIOSONDE DATA ANALYSIS II DESCRIPTION

General

GTE Sylvania, under contract by the Department of Defense (DoD), conducted a large scale analysis of approximately three million worldwide radiosonde soundings from 1966 to 1969 and 1973 to 1974. Numerous statistics of tropospheric ducts and super-refractive layers (SRLRs) were compiled. The basic pressure, temperature, and dew-point temperature profiles for each of the soundings were expanded and converted into a refractive index profile with 2 millibar increments. A search of each expanded profile was conducted to locate occurrences of gradients less than -157 N/Km (in the case of ducts) or less than -100 N/Km (in the case of SRLRs). Monthly estimates of the probability of occurrence of ducts and SRLRs were then computed for each of the 921 radiosonde stations. Characteristics such as height, thickness, intensity, and minimum trapping frequency were also computed.

The radiosonde Long-A tape, a truncated version of the Long Plus 2 tape data set represents the final output for the GTE Sylvania project (reference 2). The Long-A tape consists of 1842 records containing tropospheric ducting characteristics and weather-related parameters for 921 radiosonde stations distributed worldwide. Each set of two consecutive records supplies all the data for a particular station. The records are formatted in ASCII code with a length of 7104 bytes each. Appendix A lists the format for records 1 and 2 for an observation station. Appendix B is a listing of the included radiosonde stations.

Term Definitions

Layers are defined as surface (S), elevated-surface (ES), or elevated (E). Figures 2, 3, and 4 illustrate the M-unit versus height relationships for these layers.

The following is a description of each item contained within the two records. Appendix C contains a listing of the data as it appears on the GTE/Sylvania Long A data tape for station 4YN, fixed ship, North Pacific.

Station Number. World Meteorological Organization (WMO) block and station number.

Station Name. Station name by city and country together with a numerical indicator of coastal (1) or inland (0).

Record Sequence Number. Either record 1 or 2.

Latitude/Longitude. Station latitude and longitude to hundredth of a degree. Positive values represent north (west) and negative values represent south (east) latitude (longitudes).

Elevation. Station elevation above mean sea level in meters.

Local Time. Local time corresponding to midnight Greenwich Mean Time.

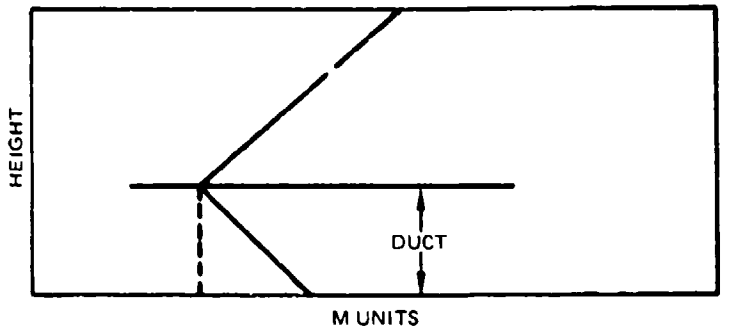

Figure 2. M-unit versus height profile for a surface duct.

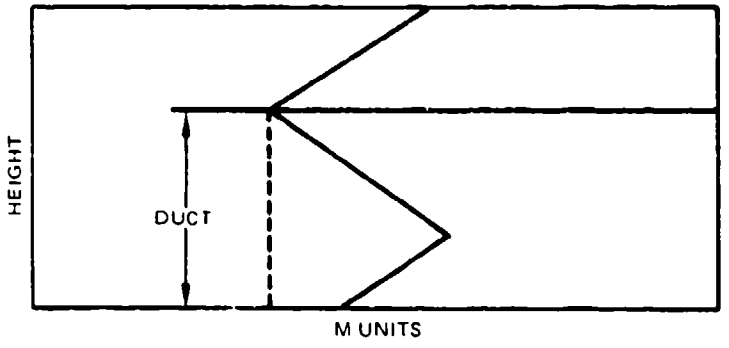

Figure 3. M-unit versus height profile for an elevated surface duct.

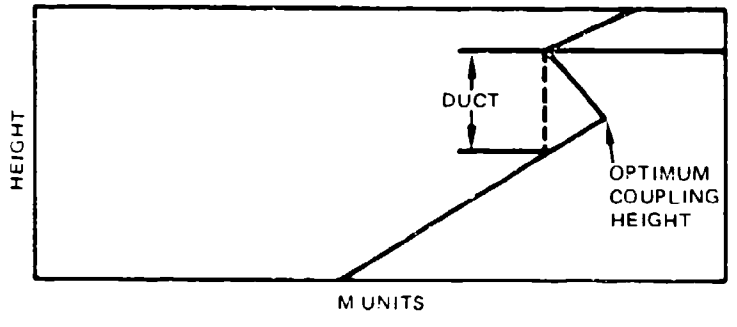

Figure 4. M-unit versus height profile for an elevated duct.

Local Time. Local time corresponding to noon Greenwich Mean Time.

Station Elevation Reliability. Errors in station elevation contribute directly to errors in duct heights and slopes. Various kinds of discrepancies were noted in the elevation of each radiosonde station. For example, during the measurement period, the station may have changed locations and thus elevations. These discrepancies have been compensated by a correction scheme. Values of 1 (most reliable) to 7 (least reliable) have been applied to the results of this compensation.

Instrument Type. A numerical designation of the two most popular types of instrument used during the last 2 years together with the percentage of the data during those 2 years for which those instruments were used. Table 1 provides the definition of the instrument designators.

Table 1. Instrument types definition.

Indicator	Definition
0	Unknown
1	USWB exposed thermister -403MC/1680MC R/S
2	Australian-Variable AM R/S
3	Bendix AN/AMT-4/4B/4D/12/ GMD-1 TMQ 5/TYPE 430
4	French – Measural
5	Canadian – Sangamo
6	Indian Chron – AM R/S 1680 MHz
7	Indian FAN – R/S
8	Russian – A 22 Malahit/RKZ-2
9	Chinese
10	West German – GRAW M60
11	Pakistani FM R/S 403 MHz
12	Finnish – Vaisala
13	Japanese – Code sending
14	Malaysia Astor 403
15	Italian – Autovox IA/AMT
16	East German – Freiberg RKS2
17	British – KEW MK II B
18	Dim Type R.V. 4
19	Omera Decca
20	PTU Swiss Institute
21	MARS 1 K

Accepted Soundings. The number of soundings for which an expanded refractive index profile was computed and a search for ducts and SRLR was conducted.

Accepted Soundings With Surface. Number and percent of soundings for which complete surface data were available.

Accepted Soundings With Signal Level. Ducts are separated into those whose minimum trapping frequency exceeds 10,000 MHz and those with frequency less than 10,000 MHz. Since measurement errors and approximations inherent in the computational procedures are probably responsible for the occurrence of the thin, high frequency ducts, only the ducts with minimum trapping frequency less than 10,000 MHz are included in the statistics.

Accepted Soundings With 1000-mb Winds. Number and percent of soundings which contain both wind speed and direction for the 1000-mb level.

Accepted Soundings With 850-mb Winds. Number of soundings which contain both wind speed and direction for the 850 mb level.

Average Mandatory Levels. Average number of mandatory levels up to the 100 mb level contained within the soundings from the last 2-years data.

Average Significant Levels. Average number of significant levels between the surface (but not including the surface) and the 500-mb level contained within the soundings from the last 2-years data.

Pressure. Median value of the atmospheric pressure in millibars at the surface of the reporting station.

Temperature. Median value of the atmospheric temperature in degrees Celsius at the surface of the reporting station.

Dew Point. Median value of the atmospheric dew point temperature in degrees Celsius at the surface of the reporting station.

NS. Median value of the refractive index at the surface of the reporting station.

NW. Median value of the "wet" component of the refractive index at the surface of the reporting station.

dN/dZ (xx). Median value of the refractive index gradient over the first xx meters above the surface at the reporting station.

Wind Direction (xx). Estimate of the wind direction distributed over a circle at the xx pressure level.

Wind Speed (xx). Median wind speed in knots at the xx pressure level.

Number of Ducts (5 Years). Number of ducts occurring over a 5-year period of the data. There is a separate entry for E, ES, and S ducts.

Number of Soundings With Ducts. Number of soundings containing at least one duct of the type E and a combination of S and ES.

Number of Soundings With SRLRs. Number of soundings containing at least one refractive layer of the type E and a combination of S and ES.

Percent Soundings With Ducts. Percent of soundings with ducts of type E, ES, or S. Statistics are provided for various time intervals and duct occurrences.

Probability >= 2 Elevated Ducts. Probability of 2 or more E ducts occurring simultaneously.

Probability S and E Ducts. Probability of S and E duct occurring simultaneously.

Median Maximum Height. Median maximum height in meters of all ducting occurrences.

Coupling Factor. The difference between the M-unit value at the surface and the top of the duct.

Bottom Height. The height in meters from the surface to the bottom of the duct.

Optimum Coupling Height. The height in meters from the surface at which the M-unit gradient becomes just trapping (inflection point).

Top Height. The height in meters from the surface to the top of the duct. For S ducts, this is equivalent to the optimum coupling height.

Thickness. The distance in meters from the bottom to the top of the duct.

Intensity. The difference between the M-unit value at the inflection point in the profile and the top of the duct.

Frequency. Median, standard deviation, and mode of the maximum electromagnetic frequency trapped within the trapping layer.

Average Gradient. Median of the M-unit gradient within the duct.

Delta M. The difference between the M-unit value at the surface (for S ducts) or at the inflection point (for ES and E ducts) and the top of the duct.

Upper Slope. The M-unit gradient over the distance from the inflection point to the top of the duct.

Lower Slope. The M-unit gradient over the distance from the bottom of the duct to the inflection point.

Surface to Inflection Point. The height in meters from the surface to the inflection point in the refractive index profile.

Surface to Bottom. The height in meters from the surface to the bottom of the duct.

Statistics

The mean is the average of the values of the given duct parameter. The standard deviation is the unbiased sample standard deviation of the value of the duct parameter. The CI (mean) gives the width of the 50-percent confidence interval for the mean, assuming that the sample was taken from a normal (Gaussian) distribution. The confidence interval width for the median will, in general, be wider than the confidence interval for the mean, since the median confidence interval is based only on the relative weak assumption of symmetry of the underlying distribution. For the case of wind direction, the 25-and 75-percent confidence interval limits are based upon symmetry about the estimated wind direction for the xx pressure level.

Additional Considerations

a. Where monthly variables are found in groups of 13, the order of the data is for January through December and annual total.

b. Where monthly numbers and percentages appear in groups of 7818 values, the order is

   1. number then percentage, alternating for months January through December and annual total.
   2. same as (1) above but for time period 0000 GMT only
   3. same as (1) above but for time period 1200 GMT only

c. Where groups of 3818 values are given for medians and confidence intervals, the order is

   1. the lower confidence intervals for January through December and annual totals.
   2. the medians for 12 months and annual totals
   3. the upper confidence intervals for 12 months and annual totals.

SECTION 3

DUCT63 DATABASE DESCRIPTION

General

The National Climatic Data Center, Asheville, North Carolina, under contract from the Naval Ocean Systems Center (NOSC), produced a subset analysis of its Standard Tape Deck Family 11 (STD-11) database. The STD-11 database consists of over 150 years of worldwide surface meteorological observations. These observations were assembled from ship logs, ship weather reporting forms, published ship observations, automatic buoys, teletype reports, and card decks purchased from foreign meteorological services.

The subset analysis, known as the DUCT63, covers 293 Marsden squares and spans 15 years of surface observations. A Marsden square is a region of the earth's surface defined by a grid of 10 degrees latitude by 10 degrees longitude and is assigned a unique identification number. Figure 5 shows the location and the numerical assignment of all Marsden squares. For example, Marsden square 1 is defined as the region bounded by the prime meridian to 10 degrees west longitude and from the equator to 10 degrees north latitude. Not all of the 648 possible Marsden squares are included in the DUCT63 analysis for two reasons. First, the analysis is specifically concerned with the maritime environment. Marsden squares not containing a region of ocean are excluded from the data. Second, a requirement of at least 100 valid observations per month was imposed to reduce the effects of any spurious meteorological measurements on the distributions.

Figure 5 shows the location of the Marsden squares contained within the DUCT63 analysis as the region enclosed by the heavy border.

DUCT63 Database Elements

The DUCT63 analysis contains distributions of meteorological quantities and surface-to-surface attenuation rates for frequencies of 35 and 94 GHz. These distributions are expressed as either a probability or a percentage of time that the quantity is observed within a specified range. The distributions include diurnal effects where day categories imply a positive solar angle within the Marsden square at the time of the meteorological observation. Night categories are times of observation between one hour after the local sunset and one hour before the local sunrise. Observations taken in the interval between the day and night categories are excluded from the data set.

There are two forms of distributions: a probability (or percent of time) distribution for a specific quantity (i.e., wind speed) and a joint probability distribution of two quantities. The latter form, also called a cross distribution, is specifically designed for use by NOSC in its research efforts.

The following quantities are distributed within the DUCT63 analysis and appear within the data in the order listed. Appendix D contains a complete listing of the data for Marsden square number 85.

1. Paulus evaporation duct height (meters).
2. Paulus evaporation duct height crossed with Jeske duct height.
3. Wind speed (meters per second).
4. Absolute humidity (grams per cubic meter).

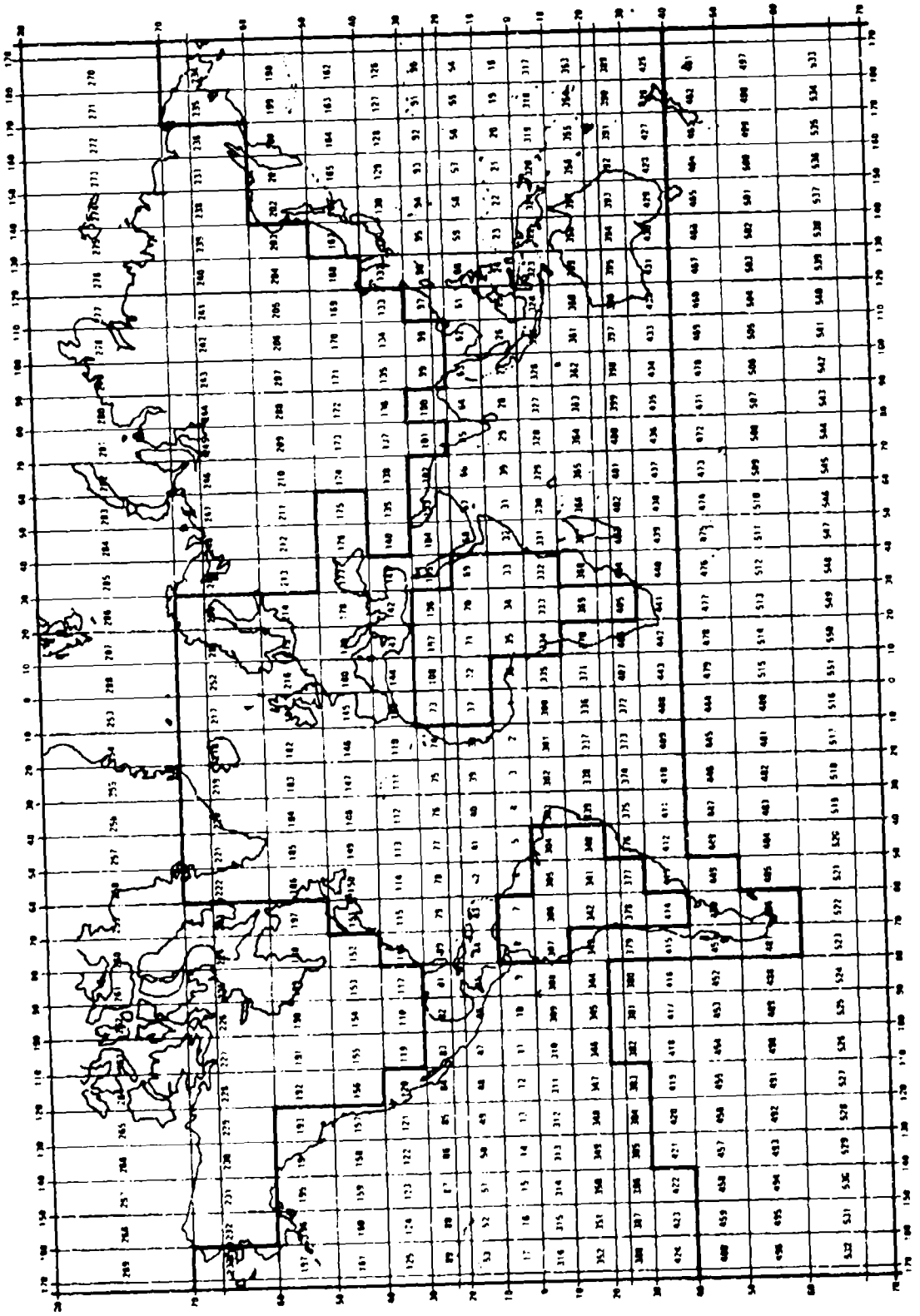

Figure 5. Marsden square numbering system for the world.

5. Modified air-sea temperature difference (deg C).
6. Rain rate (scaled millimeters per hour).
7. Attenuation rate (Gaseous) at 35 GHz (scaled dB/km).
8. Attenuation rate (Gaseous) at 94 GHz (scaled dB/km).
9. Attenuation rate (total) at 35 GHz (scaled dB/km).
10. Attenuation rate (total) at 94 GHz (scaled dB/km).
11. Paulus evaporation duct height crossed with wind speed.

Each Marsden square's data are contained within a record of 55242 bytes and formatted in ASCII code.

Each record is headed with two lines of identification data. The first line contains the Marsden square number, the mean sub square (M SUB SQ) and the period of record (POR). Marsden squares are subdivided into 1 degree sub squares and this M SUB SQ shows the mean location of all of the observations within the analysis for this square. The POR is expressed as QQRR-SSTT where QQ is the starting year, RR is the starting month, SS is the ending year and TT is the ending month. Generally, the POR is 7001-8412 indicating that the data is comprised of observations taken between January 1970 and December 1984.

The second line contains the number of records examined for the analysis, the number of records accepted as valid, the number of records which failed the quality control checks and the number of records which failed the time constraints.

Each subsequent line of data is preceded by a 10 character identification field and terminated with a 6 character card number. The format of the identification field is MSQMMDNTTT where MSQ is the Marsden square, MM is the month, DN is the day or night (1 for day, 2 for night) and TTT is the type of data. These data types are 1 for Paulus evaporation duct height, D12 for Paulus evaporation duct height crossed with Jeske duct height, W for wind speed, A for absolute humidity, M for modified air-sea temperature difference, r for rain rate, s for gaseous attenuation rate at 35 GHz, t for gaseous attenuation rate at 94 GHz, u for total attenuation rate at 35 GHz, v for total attenuation rate at 94 GHz, and M11 for Paulus evaporation duct height crossed with wind speed. For the cross distributions, the MM does not represent the month but rather, represents an index field of the cross distribution.

Details of the specific quantities and distribution characteristics are described in the following paragraphs.

Paulus Evaporation Duct Height. The Paulus formulation of evaporation duct height calculations (reference 3) is a modification to the classical Jeske method (reference 4). The major difference in the approaches is that the Paulus technique attempts to account for inaccuracies in air temperature observations which are caused by thermal influence of the ship.

The data are in month order subdivided by day and night. An observational set is divided into 27 sections (section number followed by data value). Sections 1 through 22 are the number of observations of evaporation duct height from 0 to 40 meters in 2 meter intervals with two additional categories: duct heights greater than 40 meters and duct heights that are not calculable (undefined). Sections 23 through 26 consists of the mean, first, second, and third quartile heights respectively, and section 27 is the total number of observations during the period.

Paulus Evaporation Duct Height Crossed with Jeske Duct Height. The joint probability of a duct height computed by the Paulus and Jeske methods is represented by a 22 by 22 matrix where the 22 data line pairs and the first 22 intergers within each line pair represents height intervals from 0 to 40 meters in 2 meter intervals for both Paulus and Jeske duct heights. The real number and the final integer of each line pair represents the mean value of the quantity and the number of valid observations that the distribution is derived from respectively.

Surface Wind Velocity. An observation set consists of 24 elements, i.e., the number of observations of wind velocity from 0 to 20 meters per second in 1 meter per second intervals; number of observations where winds exceeded 20 meters per second; the mean wind velocity for the period; and the total number of observations during the period.

Absolute Humidity. An observation set consists of 24 elements, i.e., the number of observations of absolute humidity from less than 1 to more than 41 grams per cubic meter (g/m**3) in 2 grams per cubic meter increments; a mean absolute humidity for the period; and the total number of observations during the period.

Modified Air-Sea Temperature Difference. The modified air-sea temperature difference is defined in reference 3. Its purpose for inclusion within the DUCT63 database is to aid NOSC research efforts in the climatological description of evaporation duct heights. An observation set consists of 24 elelements, i.e., the number of observations of modified air-sea temperature difference from less than -10 to greater than +10 degrees Celsius in 1 degree increments; a mean modified air-sea temperature difference for the period; and the total number of observations during the period.

Rain Rate. Rain rate is not a directly reported quantity in the STD-11 database. Rather, it is computed from the present weather code by techniques developed by Goroch (reference 5). An observation set consists of 24 elements, i.e., the number of observations of rain rate from less than 1 to greater than 5.01 mm/hr increments; the mean rate for the period; and the total number of observations during the period.

Gaseous Attenuation Rate at 35 GHz. This quantity is derived from observations of air temperature, relative humidity, and visibility. The reported visibility is used to calculate a value of the liquid water content based on the work of Johnson reported by Cook (reference 6). Methods described by Liebe (reference 7) are used to calculate the attenuation rate. Since the meteorological data is surface data, the attenuation rate is valid only for surface-to-surface propagation. It is not applicable for use with slant paths. An observation set consists of 24 elements, i.e., the number of observations of from less than 0.001 to greater than 5.01 dB/km in 0.025 dB/km increments; the mean gaseous attenuation rate for the period; and the total number of observations during the period.

Gaseous Attenuation Rate at 94 GHz. The description above applies to the gaseous attenuation rate of 94 GHz with two exceptions. First the frequency is 94 GHz and second, the observations range from less than 1 dB/km to greater than 5.01 dB/km in 0.25 dB/km increments.

Total Attenuation at 35 GHz. The major difference between the attenuation rate described for this quantity and the attenuation rate described in section 3 is that the total attenuation includes the effects of rain rate from section 3. The contributions from rain rate are modeled after the work of Falcone (reference 8). The data format is the same as for the 35 GHz gaseous attenuation rate.

Total Attenuation at 94 GHz. The comments of the preceding section are directly applicable for the total attenuation rate at 94 GHz. Again, it should be stressed that the meteorological data are observed at the surface and the attenuation rates described are strictly applicable to the surface-to-surface path. That is, the data are not applicable to a slant path.

Paulus Duct Height Crossed with Wind Speed. The Paulus duct height crossed with wind speed is designed primarily for use by NOSC in the determination of evaporation ducting. The format of the data is identical to that as described within section 3 except the intergers within each line pair represents wind velocities from 0 to 22 meters per second in 1 meter per second intervals.

SECTION 4

HISTORICAL PROPAGATION CONDITION DATABASE CONSTRUCTION

HEPC Radiosonde Observations

By using the technique as described below, construction of the radiosonde based portion of the database is achieved.

The following data (for an individual radiosonde station) are read from the GTE/ Sylvania Radiosonde Long A tape:

Name	Description	data type
GNSBD	N-gradient first 100 meters	median, monthly
GNSTD	N-gradient first 1000 m rs	" "
PEL00	% occur elevated duct 00Z	" "
PEL12	% occur elevated duct 12Z	" "
PES00	% occur elev-sfc duct 00Z	" "
PES12	% occur elev-sfc duct 12Z	" "
PSB00	% occur sfc-base duct 00Z	" "
PSB12	% occur sfc-base duct 12Z	" "
AAG	annual average gradient for elevated-surface and surface ducts in layer	average, annual
OHEL	elev duct optm coupling hgt	median, monthly
MTEL	elev duct median thickness	" "
MDEL	elev duct M-unit deficit	" "
GMEL	elev duct M-unit gradient	" "
MFEL	elev duct trapping freq	" "
MTES	elev-sfc duct thickness	" "
MDES	elev-sfc duct M-unit deficit	" "
MFES	elev-sfc duct trapping freq	" "
MTSB	sfc-base duct thickness	" "
MDSB	sfc-base duct M-unit deficit	" "
MFSB	sfc-base duct traping freq	" "
P2EL	probability >1 elevated duct	probability "
PSBEL	probability sfc & elev duct	" "
ACC00	number accepted soundings 00Z	number "
ACC12	number accepted soundings 12Z	" "
NS	median surface N-units	median "
SLEV	station elevation (meters)	

All N-unit gradients are converted to M-unit gradients with the following convention:

GMSBD = GNSBD + 156 (M / Km) (100 meter gradient)

GMSTD = GNSTD + 156 (M / Km) (1000 meter gradient)

TAG = (AAG + 156) / 1000 (M / Km)

Figure 6 illustrates the relationships of the above terms.

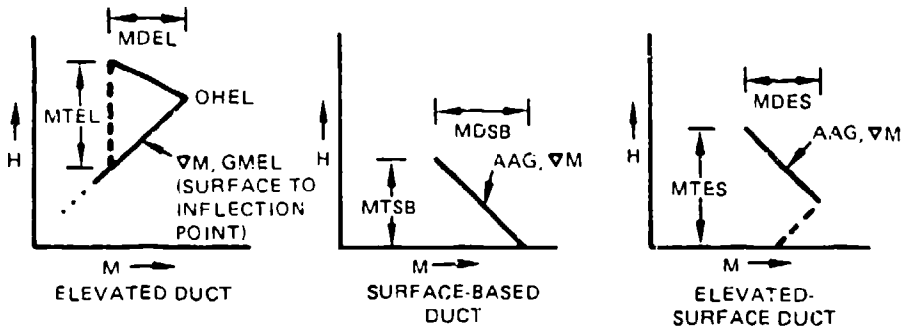

Figure 6. Variable definitions as used in elevated, surface-based and elevated-surface ducts.

The elevated-surface and the surface-based duct data is combined to produce a surface-based duct with a positive lower gradient. This is accomplished by using a weighted average of the duct thickness, M-unit deficit and the trapping frequency as described below:

elev-sfc duct ESN = (PES00 * ACC00) + (PES12 * ACC12)

sfc-based duct SBN = (PSB00 * ACC00) + (PSB12 * ACC12)

soundings with ducts TWD = ESN + SBN

weighted thickness THK = (ESN * MTES + SBN * MTSB) / TWD

weighted M deficit DM = -(ESN * MDES + SBN * MDSB) / TWD

weighted trap freq TF = (ESN * MFES + SBN * MFSB) / TWD

The optimum coupling height for surface ducts is computed as follows, insuring that a surface-based duct is formed from the statistics.

optimum height OHSB = THK - DM/TAG

if OHSB < 0, then OHSB = THK / 2

A surface-based duct M-unit deficit is computed as follows

surface M deficit SMD = OHSB * (GMSBD/1000) + DM

If SMD is greater than zero, the weighted M deficit (DM) is recomputed such that the surface deficit is 4 M-units. Setting the surface deficit to 4 M-units is a purely subjective decision. A surface-based duct must be created

weighted M deficit DM = -(4 + SMD - DM)

Figure 7 illustrates the relationships of the weighted and adjusted statistical information used to construct a TESS acceptable surface-based duct.

Table 2 illustrates the computed radiosonde database for World Meteorological Organization station 4YN, Fixed Ship, North Pacific Ocean.

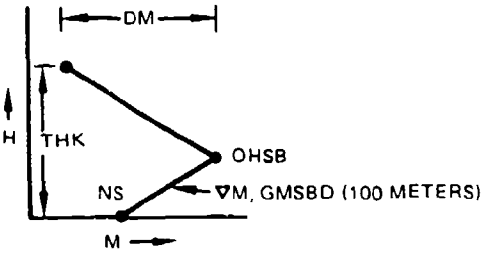

Figure 7. Variable definitions as used in constructed surface-based duct.

Table 2. Computed values for variables within the HEPC radiosonde database. WMO station 4YN, fixed ship North Pacific Ocean.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
SELV	12	12	12	12	12	12	12	12	12	12	12	12	12
ACC daytime	116	115	129	117	132	118	75	107	106	95	108	106	1324
ACC nighttime	120	112	127	107	133	120	81	108	100	95	107	97	1307
NS	343	337	337	336	341	348	351	356	359	353	341	343	345
GMSTD	107	109	112	111	109	105	105	98	102	104	108	107	107
GMSBD	85	89	92	71	97	97	94	72	85	89	84	100	90
OHSB	32	26	17	41	80	24	106	86	110	92	82	43	56
THK	89	89	88	83	133	114	144	129	137	121	125	58	98
DM	4	4	5	7	11	6	14	10	13	12	10	8	9
MFSB	730	960	746	577	575	1087	673	815	962	1014	692	3483	751
PSB daytime	19	27	18	29	11	9	16	30	25	22	12	9	19
PSB nighttime	5	3	7	9	2	1	1	3	1	3	3	0	3
GMEL	118	122	119	119	116	115	111	112	117	114	121	120	117
OHEL	1286	1522	1561	1552	1522	1185	1515	1551	1572	1544	1542	1401	1498
MTEL	180	173	172	172	168	203	210	220	171	181	215	177	186
MDEL	7	7	8	8	7	8	10	10	6	5	12	7	8
MFEL	206	186	201	205	197	151	133	119	212	216	121	194	175
PEL daytime	42	37	36	46	48	60	56	51	52	47	55	40	47
PEL nighttime	56	53	61	71	66	65	64	70	71	75	67	71	66
P2EL	466	264	234	134	264	714	705	512	874	632	279	443	445
PSBEL	339	264	195	848	226	294	641	791	388	368	186	99	376

HEPC Surface Observation

The HEPC function employs the Paulus evaporation duct heights and the surface wind velocities portion of the DUCT63. By using the technique as described below, construction of the surface observation database is achieved.

a. The following data (for an individual Marsden square) is read from the DUCT63 data tape:

Name	Description	data type
NHOD	number height observations, day	height, monthly
NHON	numbe. neight observations, night	height, monthly
TAOD	total accepted observations, ducts	monthly
MSWV	surface wind velocity	ean, mon nly
NAOW	total accepted observations, wind	nthly

b. The percent occurrence of evaporation ducts is given by

POED (day) = NHOD / TAOD

POED (night) = NHON /TAOD

c. The mean surface wind velocity is transferred to the database without processing.

d. If the total number of accepted observations is less than 10 for the evaporation duct height or the surface wind velocity, a -1. (indicating an error) is substituted for the calculated value.

Tables 3 and 4 illustrate the computed surface observation database (day and night respectively) for Marsden square 85.

Table 3. Computed values for variables within the HEPC surface observation database, Marsden square 85 (daytime).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
00-02 meters	3.1	2.4	2.2	1.7	2.3	2.8	3.2	3.6	1.9	2.2	1.8	1.8
02-04 meters	1.8	1.8	1.8	.8	1.5	2.7	1.9	1.9	1.3	.7	1.2	1.6
04-06 meters	5.2	4.6	2.9	2.7	2.7	4.9	5.6	3.9	3.6	2.0	3.1	3.4
06-08 meters	7.6	7.6	6.3	4.7	5.9	7.6	7.6	7.2	5.7	5.4	4.3	7.0
08-10 meters	11.0	12.2	11.0	9.6	10.2	11.4	12.4	10.8	9.8	8.9	8.1	10.3
10-12 meters	14.5	15.6	14.9	12.8	17.6	16.8	19.2	15.3	13.3	12.7	12.6	13.7
12-14 meters	16.6	16.1	17.4	15.8	18.3	19.0	18.4	17.6	17.0	16.0	15.4	15.0
14-16 meters	13.7	13.4	13.8	15.1	15.8	13.6	14.7	16.6	16.4	16.3	16.1	14.5
16-18 meters	11.5	10.4	12.7	14.8	11.6	11.1	8.5	11.4	12.9	12.2	12.5	12.1
18-20 meters	7.2	6.9	7.8	10.6	7.4	5.5	4.4	5.6	7.8	10.3	10.9	8.9
20-22 meters	4.4	4.5	5.2	6.5	4.1	2.5	2.4	3.6	4.7	7.1	7.0	5.6
22-24 meters	1.9	2.5	2.3	2.9	1.7	1.2	1.1	1.6	3.1	3.0	3.8	3.4
24-26 meters	.8	1.0	1.3	.9	.6	.4	.3	.6	1.4	1.4	1.3	1.7
26-28 meters	.4	.5	.4	.5	.2	.2	.1	.1	.5	1.0	1.0	.8
28-30 meters	.2	.2	.2	.3	.2	.1	.1	.1	.3	.4	.5	.1
30-32 meters	.0	.2	.0	.2	.1	.0	.0	.0	.1	.1	.2	.1
32-34 meters	.0	.0	.0	.0	.0	.0	0	.0	.1	.1	.0	.1
34-36 meters	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
36-38 meters	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
38-40 meters	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0
> 40 meters	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
mean height	12.7	12.9	13.3	14.2	13.1	12.2	11.9	12.6	13.7	14.3	14.4	13.7
# of soundings	2278	2218	2397	2555	2480	2405	2355	2190	2074	2534	2391	2244
wind (m/sec)	6.8	6.7	6.7	7.2	6.8	6.6	6.6	6.2	6.1	6.1	6.6	7.0

Table 4. Computed values for variables within the HEPC surface observation database, Marsden square 85 (nighttime).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
00-02 meters	2.1	1.9	1.1	.9	1.0	1.3	2.1	2.3	1.2	1.0	.6	1.2
02-04 meters	2.8	3.5	2.6	2.5	2.5	3.2	5.0	3.4	3.3	1.7	2.2	2.2
04-06 meters	6.0	6.2	6.2	4.6	5.0	7.3	6.4	6.3	7.4	4.9	4.8	4.5
06-08 meters	12.3	11.8	10.8	9.1	11.1	12.7	14.6	11.8	9.0	10.5	8.2	8.5
08-10 meters	15.2	17.4	15.3	14.1	17.4	19.3	21.0	19.2	16.0	12.6	11.6	15.5
10-12 meters	17.2	17.0	17.5	17.7	23.0	22.1	20.8	18.5	19.6	16.8	17.5	17.2
12-14 meters	15.5	14.5	16.7	18.4	17.0	16.8	16.4	18.3	14.8	17.5	17.5	16.6
14-16 meters	13.2	12.9	13.2	14.8	11.7	10.4	7.4	11.1	12.8	15.3	15.9	13.1
16-18 meters	7.2	7.1	9.0	10.2	6.3	3.8	4.0	5.1	8.4	10.2	11.0	9.2
18-20 meters	4.9	4.3	4.6	4.9	3.4	1.9	1.4	2.5	3.8	4.6	5.8	6.6
20-22 meters	2.0	2.1	1.8	1.9	.9	.9	.6	1.0	2.4	2.8	2.4	3.3
22-24 meters	.8	.7	.6	.7	.3	.2	.3	.2	.8	1.6	1.6	1.3
24-26 meters	.4	.5	.5	.2	.2	.1	.2	.2	.1	.4	.5	.5
26-28 meters	.2	.1	.1	.2	.0	.0	.0	.1	.5	.3	.3	.2
28-30 meters	.0	.1	.1	.0	.0	.0	.0	.0	.0	.1	.1	.1
30-32 meters	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1
32-34 meters	.0	.0	.1	.0	.0	.0	.0	.1	.0	.0	.1	.0
34-36 meters	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
36-38 meters	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
38-40 meters	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
> 40 meters	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1
mean height	11.4	11.3	11.7	12.0	11.3	10.5	10.1	10.7	11.5	12.3	12.6	12.3
# of soundings	1872	1750	1906	1970	2004	1927	1939	1789	1653	1998	1899	1770
wind (m/sec)	6.5	6.5	6.5	6.8	6.5	6.4	6.3	5.9	5.7	5.7	6.2	6.7

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APPENDIX A

Format	Layer	Variable	Type	Statistic	Time
2A4		Station Number			
11A4		Station Name and CI indicator			
I4		Record Sequence Number (1 or 2)			
I8		Latitude (hundredths of Degrees)			
I8		Longitude (hundredths of degrees)			
I8		Elevation (meters)			
I8		Local time (hundredths of hours)			00Z
I8		Local time (hundredths of hours)			12Z
I8		Station elevation reliability			
I8		Most common instrument type			
I8		Percent of time used			
I8		2nd most common instrument type			
I8		Percent of time used			
78I8		Accepted soundings	monthly	#; %	all; 00; 12
78I8		Accepted soundings with surface	monthly	#; %	all; 00; 12
78I8		Accepted soundings with signal level	monthly	#; %	all; 00; 12
13I8		Accepted soundings with 1000mb winds	monthly	#	all
13I8		Accepted soundings with 850mb winds	monthly	#	all
13I8		Average mandatory levels	monthly	#	all
13I8		Average significant levels	monthly	#	all
39I8		Pressure (millibars)	monthly	LCI; med; UCL	all
39I8		Temperature (Celsius)	monthly	LCI; med; UCL	all
39I8		Dew point (Celsius)	monthly	LCI; med; UCL	all
39I8		Ns	monthly	LCI; med; UCL	all
39I8		Nw	monthly	LCI; med; UCL	all
39I8		No	monthly	LCI; med; UCL	all
13I8		del N (50) (N units km)		monthly	med
13I8		del N (100) (N units km)		monthly	med
13I8		del N (500) (N units km)		monthly	med
13I8		del N (1000) (N units km)		monthly	med
39I8		Wind direction (1000 mb)	monthly	LCI; med; UCI	all
39I8		Wind direction (850 mb)	monthly	LCI; med; UCI	all
39I8		Wind speed (1000 mb) (knots)	monthly	LCI; med; UCI	all
39I8		Wind speed (850 mb) (knots)	monthly	LCI; med; UCI	all
13I8	E	Number of ducts (5 years)	monthly	#	all
13I8	ES	Number of ducts (5 years)	monthly	#	all
13I8	S	Number of ducts (5 years)	monthly	#	all
I8	S & ES	Number of soundings with ducts		#	all
I8	E	Number of soundings with ducts		#	all
I8	S & ES	Number of soundings with SRLR's		#	all
I8	E	Number of soundings with SRLR's		#	all

Sylvania Long-A tape format Record 1

Format	Layer	Variable	Type	Statistic	Time
2A4		Station Number			
11A4		Station Name and CI indicator			
I4		Record Sequence Number (1 or 2)			
39I8	all	% soundings with ducts	monthly	LCI; med; UCI	all
13I8	all	% soundings with ducts	monthly	LCI; %	00Z
13I8	all	% soundings with ducts	monthly	LCI; %	12Z
39I8	E	% soundings with ducts	monthly	LCI; med; UCI	all
13I8	E	% soundings with ducts	monthly	LCI; %	00Z
13I8	E	% soundings with ducts	monthly	LCI; %	12Z
39I8	ES	% soundings with ducts	monthly	LCI; med; UCI	all
13I8	ES	% soundings with ducts	monthly	LCI; %	00Z
13I8	ES	% soundings with ducts	monthly	LCI; %	12Z
39I8	S	% soundings with ducts	monthly	LCI; med; UCI	all
13I8	S	% soundings with ducts	monthly	LCI; %	00Z
13I8	S	% soundings with ducts	monthly	LCI; %	12Z
13I8	E	Probability (>= 2 elevated ducts)	monthly		all
13I8	E, S, ES	Probability (S and E ducts)	monthly		all
I8		Median maximum height	annual	med	
3I8	E	Coupling factor (duct)	annual	LCI; med; UCI	
I8	E	Bottom height (ducts)	annual	med	all
I8	E	Bottom height (ducts)	annual	x	all
I8	E	Bottom height (ducts)	annual	s	all
I8	E	Optimum coupling height (ducts)	annual	med	all
I8	E	Optimum coupling height (ducts)	annual	x	all
I8	E	Optimum coupling height (ducts)	annual	s	all
I8	E	Top height (ducts)	annual	med	all
I8	E	Top height (ducts)	annual	x	all
I8	E	Top height (ducts)	annual	s	all
I8	E	Thickness (ducts)	annual	med	all
I8	E	Thickness (ducts)	annual	x	all
I8	E	Thickness (ducts)	annual	s	all
I8	E	Intensity (ducts)	annual	med	all
I8	E	Intensity (ducts)	annual	x	all
I8	E	Intensity (ducts)	annual	s	all
I8	E	Frequency (ducts)	annual	med	all
I8	E	Frequency (ducts)	annual	x	all
I8	E	Frequency (ducts)	annual	s	all
I8	E	Average gradient (ducts)	annual	med	all
I8	E	Average gradient (ducts)	annual	x	all
I8	E	Average gradient (ducts)	annual	s	all

Sylvania Long-A tape format Record 2

Format	Layer	Variable	Type	Statistic	Time
I8	S & ES	Thickness (ducts)	annual	x	all
I8	S & ES	Thickness (ducts)	annual	s	all
I8	S & ES	Intensity (ducts)	annual	med	all
I8	S & ES	Intensity (ducts)	annual	x	all
I8	S & ES	Intensity (ducts)	annual	s	all
I8	S & ES	Frequency (ducts)	annual	med	all
I8	S & ES	Frequency (ducts)	annual	x	all
I8	S & ES	Frequency (ducts)	annual	s	all
I8	S & ES	Average gradient (ducts)	annual	med	all
I8	S & ES	Average gradient (ducts)	annual	x	all
I8	S & ES	Average gradient (ducts)	annual	s	all
I8	S & ES	Thickness (SRLR)	annual	med	all
I8	S & ES	Thickness (SRLR)	annual	x	all
I8	S & ES	Thickness (SRLR)	annual	s	all
I8	S & ES	Intensity (SRLR)	annual	med	all
I8	S & ES	Intensity (SRLR)	annual	x	all
I8	S & ES	Intensity (SRLR)	annual	s	all
I8	S & ES	Frequency (SRLR)	annual	med	all
I8	S & ES	Frequency (SRLR)	annual	x	all
I8	S & ES	Frequency (SRLR)	annual	s	all
I8	S & ES	Average gradient (SRLR)	annual	med	all
I8	S & ES	Average gradient (SRLR)	annual	x	all
I8	S & ES	Average gradient (SRLR)	annual	s	all
3I8	E	Optimum coupling height (duct) - January	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - February	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - March	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - April	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - May	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - June	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - July	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - August	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - September	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - October	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - November	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - December	monthly	LCI; med; UCI	all
3I8	E	Optimum coupling height (duct) - Total	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - January	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - February	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - March	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - April	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - May	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - June	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - July	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - August	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - September	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - October	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - November	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - December	monthly	LCI; med; UCI	all
3I8	E	Thickness (duct) - Total	monthly	LCI; med; UCI	all

Sylvania Long-A tape format Record 2 (continued)

Format	Layer	Variable	Type	Statistic	Time
3I8	E	Delta M (duct) - Janauary	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - February	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - March	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - April	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - May	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - June	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - July	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - August	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - September	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - October	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - November	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - December	monthly	LCI; med; UCI	all
3I8	E	Delta M (duct) - Total	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - Janauary	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - February	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - March	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - April	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - May	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - June	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - July	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - August	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - September	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - October	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - November	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - December	monthly	LCI; med; UCI	all
3I8	E	Upper slope (duct) - Total	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - January	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - February	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - March	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - April	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - May	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - June	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - July	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - August	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - September	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - October	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - November	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - December	monthly	LCI; med; UCI	all
3I8	E	Lower slope (duct) - Total	monthly	LCI; med; UCI	all

Sylvania Long-A tape format Record 2 (continued)

Format	Layer	Variable	Type	Statistic	Time
3I8	E	Surface to inflection point (duct) - January	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - February	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - March	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - April	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - May	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - June	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - July	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - August	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - September	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - October	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - November	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - December	monthly	LCI; med; UCI	all
3I8	E	Surface to inflection point (duct) - Total	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - January	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - February	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - March	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - April	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - May	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - June	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - July	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - August	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - September	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - October	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - November	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - December	monthly	LCI; med; UCI	all
3I8	E	Surface to bottom (duct) - Total	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - January	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - February	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - March	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - April	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - May	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - June	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - July	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - August	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - September	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - October	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - November	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - December	monthly	LCI; med; UCI	all
3I8	ES	Thickness (duct) - Total	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - Janauary	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - February	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - March	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - April	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - May	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - June	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - July	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - August	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - September	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - October	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - November	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - December	monthly	LCI; med; UCI	all
3I8	ES	Delta M (duct) - Total	monthly	LCI; med; UCI	all

Sylvania Long-A tape format Record 2 (continued)

Format	Layer	Variable	Type	Statistic	Time
3I8	S	Thickness (duct) - January	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - February	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - March	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - April	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - May	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - June	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - July	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - August	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - September	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - October	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - November	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - December	monthly	LCI; med; UCI	all
3I8	S	Thickness (duct) - Total	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - January	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - February	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - March	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - April	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - May	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - June	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - July	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - August	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - September	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - October	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - November	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - December	monthly	LCI; med; UCI	all
3I8	S	Delta M (duct) - Total	monthly	LCI; med; UCI	all
39I8	S	Trapping frequency (ducts)	monthly	LCI; med; UCI	all
39I8	ES	Trapping frequency (ducts)	monthly	LCI; med; UCI	all
39I8	E	Trapping frequency (ducts)	monthly	LCI; med; UCI	all

Sylvania Long-A tape format Record 2 (continued)

APPENDIX B

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
10035	SCHLESWIG, GERMANY	1	54.53	-9.55	216
10184	GREIFSWALD, GERMANY	0	54.10	-13.38	215
10202	EMDEN-WOLTHUSEN, GERMANY	0	53.37	-7.22	216
10238	GERGEN/HOHNE, GERMANY	0	52.82	-9.93	216
10307	RHEINE/WALDHUGEL, WEST GERMANY	0	52.27	-7.43	216
10338	HANNOVER, GERMANY	0	52.47	-9.70	216
10384	BERLIN/TEMPELHOF, GERMANY	0	52.47	-13.40	215
10393	LINDENBERG, GERMANY	0	52.22	-14.12	215
10404	GOCH, WEST GERMANY	0	51.68	-6.17	216
10410	ESSEN, GERMANY	0	51.40	-6.97	216
10486	WAHNSDORF, GERMANY	0	51.12	-13.68	215
10548	METINGEN, GERMANY	0	50.55	-10.37	215
10618	IDAR/OBERSTEIN, GERMANY	0	49.70	-7.33	180
10687	GRAFENWOHR, GERMANY	0	50.17	-12.58	215
10739	STUTTGART/CANNSTADT, GERMANY	0	48.83	-9.20	180
10771	GARMERSDORF, GERMANY	0	49.43	-11.90	179
10866	MUNCHEN/RIEM, GERMANY	0	48.13	-11.72	179
11035	WIEN/HOHE-WARTE, AUSTRIA	0	48.25	-16.37	179
11518	PRAHA/RUZYNE, CZECHOSLOVAKIA	0	50.10	-14.30	215
11520	LIBUS, CZECHOSLOVAKIA	0	50.00	-14.45	215
11934	POPRAD/TATRY, CZECHOSLOVAKIA	0	49.07	-20.25	178
12105	KOSZALIN, POLAND	1	54.20	-16.20	215
12120	LEBA, POLAND	1	54.75	-17.53	215
12330	POZNAN, POLAND	0	52.42	-16.83	215
12374	LEGIONOWO, POLAND	0	52.40	-20.97	214
12425	WROCLAW I, POLAND	0	51.13	-16.98	215
12843	BUDAPEST-LORINC, HUNGARY	0	47.43	-19.18	179
12982	SZEGED, HUNGARY	0	46.25	-20.10	178
13130	ZAGREB/MAKSIMIR, YUGOSLAVIA	0	45.82	-16.03	179
13275	BELGRADE/ZELENO, YUGOSLAVIA	0	44.78	-20.53	178
13276	BEOGRAD/ZELENO BRDO, YUGOSLAVIA	0	44.80	-20.50	178
15120	CLUJ, RUMANIA	0	46.78	-23.57	178
15420	BUCURESTI/BANEASA, RUMANIA	0	44.50	-26.13	178
15480	CONSTANTA C., RUMANIA	1	44.22	-28.63	178
15614	SOFIA (OBSERV.), BULGARIA	0	42.82	-23.38	178
15730	KURDJALI, BULGARIA	0	41.63	-25.40	178
16044	UDINE/CAMPOFORMIDO, ITALY	0	46.03	-13.18	179
16080	MILANO/LINATE, ITALY	0	45.43	-9.28	180
16242	ROMA/FIUMICINO, ITALY	1	41.80	-12.23	179
16320	BRINDISI, ITALY	1	40.65	-17.95	179
16420	MESSINA, ITALY	1	38.20	-15.60	143
16560	CAGLIARI/ELMAS, ITALY	1	39.25	-9.05	144
16596	ORENDI, MALTA	1	35.83	-14.43	143
16622	THESSALONIKI/MIKRA, GREECE	1	40.52	-22.97	178
16716	ATHINAI/HELLINIKON, GREECE	1	37.90	-23.73	142
16754	HERAKLION CRETE, GREECE	1	35.33	-25.18	142
17030	SAMSUN, TURKEY	1	41.28	-36.33	177
17062	ISTANBUL/GOZTEPE, TURKEY	1	40.97	-29.08	178
17130	ANKARA/CENTRAL, TURKEY	0	39.95	-32.88	141

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
17220	IZMIR, TURKEY	1	38.43	-27.17	142
17240	ISPARTA, TURKEY	0	37.75	-30.55	141
17280	DIYARBAKIR, TURKEY	0	37.88	-40.20	140
17603	EPISKOPI, CYPRUS	1	34.68	-32.82	141
17606	NICOSIA AIRFIELD, CYPRUS	1	35.20	-33.30	141
20046	OSTROV HEJSA, U.S.S.R	1	80.62	-58.05	931
20069	OSTROV VIZE, U.S.S.R.	1	79.50	-76.98	281
20107	BARENCBURG, U.S.S.R.	1	78.07	-14.22	287
20274	OSTROV UEDINENIJA, U.S.S.R.	1	77.50	-82.23	280
20292	MYS CELJUSKIN, U.S.S.R.	1	77.72	-104.28	278
20353	MYS ZELANIJA, U.S.S.R.	1	76.95	-68.58	282
20667	OSTROV BELJY, U.S.S.R.	1	73.33	-70.03	281
20674	OSTROV DIKSON, U.S.S.R.	1	73.50	-80.23	280
20744	MALYE KARMAKULY, U.S.S.R.	1	72.38	-52.73	283
20891	HATANGA, U.S.S.R.	0	71.98	-102.47	278
21358	OSTROV ZOHOVA, U.S.S.R.	1	76.15	-152.83	273
21432	OSTROV KOTEL'NYJ, U.S.S.R.	1	76.00	-137.90	275
21504	OSTROV PREOBRAZENIJA, U.S.S.R.	1	74.67	-112.93	277
21647	MYS SALAUROVA, U.S.S.R.	1	73.18	-143.93	274
21824	BUHTA TIKSI, U.S.S.R.	1	71.58	-128.92	276
21946	COKURDAH, U.S.S.R.	0	70.62	-147.88	274
21965	OSTROV CETYREHSTOLBOVOJ, U.S.S.R.	1	70.63	-162.40	272
21982	OSTROV VRANGELJA, U.S.S.R.	1	70.97	178.53	270
22113	MURMANSK, U.S.S.R.	0	68.97	-33.05	249
22217	KANDALAKSA, U.S.S.R.	0	67.13	-32.43	249
22271	SOJNA, U.S.S.R.	0	67.88	-44.13	248
22522	KEM'-PORT, U.S.S.R.	0	64.98	-34.78	249
22550	ARKHANGELSK, U.S.S.R.	0	64.58	-40.50	248
22802	SORTOVALA, U.S.S.R.	1	61.72	-30.72	249
22820	PETROZAVODSK, U.S.S.R.	0	61.82	-34.27	249
22845	KARGOPOL', U.S.S.R.	0	61.50	-38.93	249
23022	AMDERMA, U.S.S.R.	1	69.77	-61.68	246
23077	NORILSK, U.S.S.R.	0	69.02	-86.12	244
23146	MYS KAMENNYJ, U.S.S.R.	1	68.47	-73.60	245
23205	NAR'JAN-MAR, U.S.S.R.	0	67.65	-53.02	247
23274	IGARKA, U.S.S.R.	0	67.47	-86.57	244
23330	SALE-HARD, U.S.S.R.	0	66.53	-66.53	246
23418	PECORA, U.S.S.R.	0	65.12	-57.10	247
23472	TURUHANSK, U.S.S.R.	0	65.78	-87.95	244
23552	TARKO-SALE, U.S.S.R.	0	64.92	-77.82	245
23804	SYKTYVKAR, U.S.S.R.	0	61.67	-50.85	247
23884	PODKAMENNAJA TUNGUSKA, U.S.S.R.	0	61.60	-90.00	243
23921	IVDEL, U.S.S.R.	0	60.68	-60.43	246
23933	HANTY-MANSIJSK, U.S.S.R.	0	60.97	-69.07	246
23955	ALEKSANDROVSKOE, U.S.S.R.	0	60.43	-77.87	245
24125	OLENEK, U.S.S.R.	0	68.50	-112.43	241
24266	VERHOJANSK, U.S.S.R.	0	67.55	-133.38	239
24343	ZIGANSK, U.S.S.R.	0	66.77	-123.40	240
24507	TURA, U.S.S.R.	0	64.17	-100.07	242
24641	VILJUJSK, U.S.S.R.	0	63.77	-121.62	240
24688	OJMJAKON, U.S.S.R.	0	63.27	-143.15	238

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
24726	MIRNYY, U.S.S.R.	0	62.55	-114.00	241
24790	SUSUMAN, U.S.S.R.	0	62.77	-148.17	238
24817	ERBOGACEN, U.S.S.R.	0	61.27	-108.02	242
24908	VANAVARA, U.S.S.R.	0	60.33	-102.27	242
24944	OLEKMINSK, U.S.S.R.	0	60.40	-120.42	240
24959	JAKUTSK, U.S.S.R.	0	62.08	-129.75	240
25042	AYON, U.S.S.R.	0	69.93	-167.97	236
25123	CERSKIJ, U.S.S.R.	0	68.80	-161.28	236
25173	MYS SMIDTA, U.S.S.R.	1	68.92	179.48	234
25399	MYS UZIEN, U.S.S.R.	1	66.17	169.83	233
25400	ZYRJANKA, U.S.S.R.	0	65.73	-150.90	237
25428	SHCHERBAKOVO, U.S.S.R.	0	65.22	-160.57	236
25551	MARKOVO, U.S.S.R.	0	64.68	-170.42	235
25563	ANADYR, U.S.S.R.	1	64.78	-177.57	235
25594	BUHTA PROVIDENIJA, U.S.S.R.	1	64.43	173.23	234
25677	BUHTA UGOLNAJA, U.S.S.R.	1	63.05	-179.32	235
25703	SEJMCAN, U.S.S.R.	0	62.92	-152.42	237
25822	EVENSK, U.S.S.R.	0	61.85	-160.57	236
25913	NAGAEVO, U.S.S.R.	1	59.58	-150.78	201
25954	KORF, U.S.S.R.	1	60.35	-166.00	236
26038	TALLIN, U.S.S.R.	1	59.42	-24.80	214
26063	LENINGRAD (TOWN), U.S.S.R.	1	59.97	-30.30	213
26258	PSKOV, U.S.S.R.	0	57.83	-28.35	214
26298	BOLOGOE, U.S.S.R.	0	57.90	-34.05	213
26406	LIEPAJA, U.S.S.R.	1	56.55	-21.02	214
26422	RIGA, U.S.S.R.	1	56.97	-24.07	214
26477	VELIKIE LUKI, U.S.S.R.	0	56.38	-30.60	213
26629	KAUNAS, U.S.S.R.	0	54.88	-23.88	214
26702	KALININGRAD, U.S.S.R.	1	54.70	-20.62	214
26781	SMOLENSK, U.S.S.R.	0	54.75	-32.07	213
26850	MINSK, U.S.S.R.	0	53.87	-27.53	214
27037	VOLOGDA, U.S.S.R.	0	59.28	-39.87	213
27196	KIROV, U.S.S.R.	0	58.65	-49.62	212
27553	GORKIJ, U.S.S.R.	0	56.22	-43.82	212
27595	KAZAN, U.S.S.R.	0	55.78	-49.18	212
27612	MOSKVA, U.S.S.R.	0	55.75	-37.57	213
27707	SUHINICI, U.S.S.R.	0	54.12	-35.33	213
27731	RJAZAN, U.S.S.R.	0	54.62	-39.72	213
27947	TAMBOV, U.S.S.R.	0	52.73	-41.47	212
27962	PENZA, U.S.S.R.	0	53.13	-45.02	212
28225	PERM, U.S.S.R.	0	58.02	-56.30	211
28275	TOBOLSK, U.S.S.R.	0	58.15	-68.18	210
28440	SVERDLOVSK, U.S.S.R.	0	56.80	-60.63	210
28661	KURGAN, U.S.S.R.	0	55.47	-65.40	210
28698	OMSK, U.S.S.R.	0	54.93	-73.40	209
28722	UFA, U.S.S.R.	0	54.75	-56.00	211
28900	KUJBYSEV (BEZENCUK), U.S.S.R.	0	53.25	-50.45	211
28952	KUSTANAJ, U.S.S.R.	0	53.22	-63.62	210
29231	KOLPASEV, U.S.S.R.	0	58.30	-82.90	208
29263	ENISEJSK, U.S.S.R.	0	58.45	-92.15	207
29282	BOGUCANY, U.S.S.R.	0	58.42	-97.40	207

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
29574	KRASNOJARSK, U.S.S.R.	0	56.00	-92.88	207
29612	BARABINSK, U.S.S.R.	0	55.37	-78.40	209
29634	NOVOSIBIRSK, U.S.S.R.	0	55.03	-82.90	208
29698	NIZNE-UDINSK, U.S.S.R.	0	54.88	-99.03	207
29838	BARNAUL, U.S.S.R.	0	53.33	-83.70	208
29865	ABAKAN, U.S.S.R.	0	53.72	-91.40	207
30054	VITIM, U.S.S.R.	0	59.45	-112.58	205
30230	KIRENSK, U.S.S.R.	0	57.77	-108.12	206
30309	BRATSK, U.S.S.R.	0	56.07	-101.83	206
30372	CARA, U.S.S.R.	0	56.92	-118.37	205
30521	ZIGALOVO, U.S.S.R.	0	54.80	-105.17	206
30554	TROICKIJ PRIISK, U.S.S.R.	0	54.47	-113.58	205
30635	UST-BARGUZIN, U.S.S.R.	0	53.43	-108.98	206
30636	BARGUZIN, U.S.S.R.	0	53.60	-109.60	206
30673	MOGOCA, U.S.S.R.	0	53.73	-119.78	205
30692	SKOVORODINO, U.S.S.R.	0	54.00	-123.97	204
30710	IRKUTSK, U.S.S.R.	0	52.27	-104.35	206
30758	CITA, U.S.S.R.	0	52.02	-113.33	205
30935	KRASNYJ CIKOJ, U.S.S.R.	0	50.37	-108.75	206
30965	BORZJA, U.S.S.R.	0	50.38	-116.52	205
31004	AIDAN, U.S.S.R.	0	58.62	-125.37	204
31088	OHOTSK, U.S.S.R.	1	59.37	-143.20	202
31168	AJAN, U.S.S.R.	1	56.45	-138.15	203
31300	ZEJA, U.S.S.R.	0	53.75	-127.23	204
31329	EKIMCAN, U.S.S.R.	0	53.07	-132.93	203
31369	NIKOLAEVSK-NA-AMURE, U.S.S.R.	0	53.15	-140.70	202
31510	BLAGOVESCENSK, U.S.S.R.	0	50.27	-127.50	204
31538	SUTUR, U.S.S.R.	0	50.07	-132.13	203
31561	KOMSOMOL'SK-NA-AMUR', U.S.S.R.	0	50.60	-137.08	203
31707	EKATERINO-NIKOLSKOE, U.S.S.R.	0	47.73	-130.97	167
31735	HARBAROVSK, U.S.S.R.	0	48.52	-135.17	167
31770	SOVETSKAYA GAVAN, U.S.S.R.	1	49.00	-140.27	166
31873	IMAN, U.S.S.R.	0	45.87	-133.73	167
31909	TERNEJ, U.S.S.R.	1	45.03	-136.67	167
31960	VLADIVOSTOK, U.S.S.R.	1	43.12	-131.90	167
32061	ALEKSANDROVSK SAHALINSKI, U.S.S.R.	1	50.90	-142.17	202
32098	PORONAJSK, U.S.S.R.	0	49.22	-143.10	166
32099	N. TERPENIYA, U.S.S.R.	1	48.90	-144.60	166
32150	JUZNO-SAHALINSK, U.S.S.R.	1	46.92	-142.73	166
32165	JUZNO-KURILSK, U.S.S.R.	1	44.02	-145.82	166
32186	URUP, U.S.S.R.	1	46.20	-150.50	165
32217	MYS VASILEVA, U.S.S.R.	1	50.00	-155.38	201
32389	KLJUCI, U.S.S.R.	0	56.32	-160.83	200
32477	SOBOLEVO, U.S.S.R.	1	54.30	-155.97	201
32540	PETROPAVLOVSK-KAMCATSKIJ, U.S.S.R.	0	52.97	-158.75	201
32618	OSTROV BERINGA, U.S.S.R.	1	55.20	-165.98	200
33008	BREST, U.S.S.R.	0	52.12	-23.68	214
33036	MOZYR, U.S.S.R.	0	52.00	-29.20	214
33041	GOMEL, U.S.S.R.	0	52.45	-31.00	213
33317	SEPETOVKA, U.S.S.R.	0	50.17	-27.05	214
33345	KIEV, U.S.S.R.	0	50.40	-30.45	213

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
33393	LVOV, U.S.S.R.	0	49.82	-23.95	178
33631	UZGOROD, U.S.S.R.	0	48.63	-22.27	178
33658	CERNOVCY, U.S.S.R.	0	48.27	-25.97	178
33791	KRIVOJ ROG, U.S.S.R.	0	47.93	-33.33	177
33815	KISINEV, U.S.S.R.	0	47.02	-28.87	178
33837	ODESSA, U.S.S.R.	1	46.48	-30.63	177
33946	SIMFEROPOL, U.S.S.R.	1	45.02	-33.98	177
34009	KURSK, U.S.S.R.	0	51.65	-36.18	213
34122	VORONEZ, U.S.S.R.	0	51.70	-39.17	213
34172	SARATOV, U.S.S.R.	0	51.57	-46.03	212
34247	KALAC, U.S.S.R.	0	50.42	-41.05	212
34300	HARKOV, U.S.S.R.	0	49.93	-36.28	177
34560	VOLGOGRAD, U.S.S.R.	0	48.68	-44.35	176
34731	ROSTOV-NA-DONU, U.S.S.R.	1	47.25	-39.82	177
34858	DIVNOE, U.S.S.R.	0	45.92	-43.35	176
34880	ASTRAHAN, U.S.S.R.	1	46.27	-48.03	176
35108	URALSK, U.S.S.R.	0	51.25	-51.40	211
35121	ORENBURG, U.S.S.R.	0	51.75	-55.10	211
35229	AKTJUBINSK, U.S.S.R.	0	50.28	-57.15	211
35361	AMANGELDY, U.S.S.R.	0	50.13	-65.23	210
35394	KARAGANDA, U.S.S.R.	0	49.80	-73.13	173
35671	DZEZKAZGAN, U.S.S.R.	0	47.80	-67.72	174
35700	GUREV, U.S.S.R.	1	47.02	-51.85	175
35746	ARALSKOE MORE, U.S.S.R.	0	46.78	-61.67	174
35796	BALHAS, U.S.S.R.	0	46.90	-75.00	173
36003	PAVLODAR, U.S.S.R.	0	52.28	-76.95	209
36096	KYZYL, U.S.S.R.	0	51.67	-94.38	207
36177	SEMIPALATINSK, U.S.S.R.	0	50.35	-80.25	208
36259	KOSH AGACHI, U.S.S.R.	0	50.00	-88.83	208
36859	PANFILOV, U.S.S.R.	0	44.17	-80.07	172
36870	ALMA-ATA, U.S.S.R.	0	43.23	-76.93	173
36974	NARYN, U.S.S.R.	0	41.43	-76.00	173
37018	TUAPSE, U.S.S.R.	1	44.10	-39.07	177
37054	MINERALNYE VODY, U.S.S.R.	0	44.22	-43.10	176
37260	BABUSERI (SUHUMI), U.S.S.R.	1	42.87	-41.13	176
37472	MAHACKALA, U.S.S.R.	0	43.02	-47.43	176
37484	BATUMI, U.S.S.R.	1	41.65	-41.63	176
37549	TBILISI, U.S.S.R.	0	41.68	-44.95	176
37789	EREVAN, U.S.S.R.	0	40.13	-44.47	176
37860	BIAN/BAKU, U.S.S.R.	1	40.65	-49.98	176
37985	LENKORAN, U.S.S.R.	0	38.73	-48.83	140
38062	KZYL-ORDA ZAGORDNAJA, U.S.S.R.	0	44.77	-65.53	174
38341	DZAMBUL, U.S.S.R.	0	42.85	-71.38	173
38353	FRUNZE, U.S.S.R.	0	42.83	-74.58	173
38392	TASAUZ, U.S.S.R.	0	41.83	-59.98	175
38413	TAMDY, U.S.S.R.	0	41.73	-64.62	174
38457	TASKENT, U.S.S.R.	0	41.27	-69.27	174
38507	KRASNOVODSK, U.S.S.R.	1	40.03	-52.98	175
38613	DZALAL-ABAD, U.S.S.R.	0	40.92	-72.95	173
38687	CARDZOU, U.S.S.R.	0	39.08	-63.60	138
38750	GASAN-KULI, U.S.S.R.	1	37.47	-53.97	139

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
38836	DUSANBE, U.S.S.R.	0	38.58	-68.78	138
38880	ASHABAD, U.S.S.R.	0	37.97	-58.33	139
38927	TERMEZ, U.S.S.R.	0	37.23	-67.32	138
38954	MOROG, U.S.S.R.	0	37.50	-71.50	137
38989	TAKHTA-BAZAR, U.S.S.R.	0	35.95	-62.90	138
40007	ALEPPO, SYRIA	0	36.12	-37.22	141
40100	BEYROUTH (AEROPORT), LEBANON	1	33.82	-35.48	141
40179	BET DAGAN, ISRAEL	1	32.00	-34.82	141
40265	MAFRAQ, JORDAN	0	32.37	-36.27	141
40372	KUWAIT INTERNATIONAL AIRPORT, KUWAIT	1	29.22	-47.98	104
40427	BAHRAIN/MUHARRAQ, PERSIAN GULF	1	26.30	-50.60	103
40438	RIYADH, SAUDI ARABIA	0	24.70	-46.73	104
40477	JEDDAH, SAUDI ARABIA	1	21.50	-39.20	105
40564	MASIRAH, OTHER TERRITORIES IN ARABIA	1	20.67	-58.90	103
40597	ADEN/KHORMAKSAR, ARABIA-RED SEA	1	13.38	-45.05	68
40608	MOSUL, IRAQ	0	36.30	-43.20	140
40650	BAGHDAD, IRAQ	0	33.23	-44.23	140
40689	BASRAH, IRAQ	0	30.57	-47.78	140
40706	TABRIZ, IRAN	0	38.13	-46.25	140
40745	MASHHAD, IRAN	0	36.27	-59.63	139
40754	TEHRAN/MEHRABAD, IRAN	0	35.68	-51.32	139
40800	ESFAHAN, IRAN	0	32.62	-51.67	139
40841	KERMAN, IRAN	0	30.25	-56.97	139
40848	SHIRAZ, IRAN	0	29.60	-52.53	103
40948	KABUL AIRPORT, AFGHANISTAN	0	34.55	-69.22	138
41350	GAN, MALDIVE ISLANDS, INDIAN OCEAN	1	-.68	-73.17	328
41530	PESHAWAR, PAKISTAN	0	34.02	-71.58	137
41780	KARACHI AIRPORT, PAKISTAN	1	24.90	-67.13	102
41917	DACCA/TEJGAON, PAKISTAN	0	23.80	-90.40	99
42027	SRINAGAR, INDIA	0	34.08	-74.83	137
42182	NEW DELHI/SAFDARJUNG, INDIA	0	28.58	-77.20	101
42339	JODHPUR, INDIA	0	26.30	-73.02	101
42369	LUCKNOW/AMAUSI, INDIA	0	26.75	-80.88	100
42410	GAUHATI, INDIA	0	26.10	-91.58	99
42647	AHMEDABAD, INDIA	0	23.07	-72.63	101
42809	CALCUTTA/DUM DUM, INDIA	0	22.65	-88.45	100
42867	NAGPUR/SONEGAON, INDIA	0	21.10	-79.05	101
42971	BHUBANESWAR, INDIA	1	20.25	-85.83	100
43003	BOMBAY/SANTACRUZ AERODROME, INDIA	1	19.12	-72.85	65
43128	HYDERABAD/BERGAMPUT, INDIA	0	17.45	-78.47	65
43149	VISHAKHAPATNAM, INDIA	1	17.72	-83.27	64
43192	GOA/PANJIM, INDIA	1	15.48	-73.82	65
43279	MADRAS/MINAMBAKKAM, INDIA	1	13.00	-80.18	64
43295	BANGALORE, INDIA	0	12.97	-77.58	65
43333	PORT BLAIR, INDIA	1	11.67	-92.72	63
43353	COCHIN/WILLINGDON, INDIA	1	9.93	-76.23	29
43369	MINICOY, INDIA	0	8.30	-73.00	29
43371	TRIVANDRUM, INDIA	1	8.48	-76.95	29
43466	COLOMBO, CEYLON	1	6.90	-79.87	29
44292	ULAN-BATOR, MONGOLIA	0	47.93	-106.98	170
44354	SAINSHAND, MONGOLIA	0	44.90	-110.12	169

WMO number	Station name and country	land/coast	Latitude	Longitude	Marsden square
44373	DALANZADGAD, MONGOLIA	0	43.58	-104.42	170
45004	KINGS PARK, HONG KONG	1	22.32	-114.17	97
46692	TAIPEI, CHINA (TAIWAN)	1	25.03	-121.52	96
46697	TAOYUAN, CHINA (TAIWAN)	1	25.05	-121.22	96
46734	MAKUNG, CHINA (TAIWAN)	1	23.52	-119.57	97
46747	TUNG KONG, CHINA (TAIWAN)	1	22.47	-120.43	96
46810	PRATAS IS, CHINA (TAIWAN)	1	20.67	-116.72	97
47058	PYONGYANG, KOREA	0	39.02	-125.82	132
47122	OSAN AB, KOREA	0	37.10	-127.03	132
47138	POHANG, KOREA	1	36.03	-129.38	132
47187	MOSULPO AB, KOREA	1	33.20	-126.22	132
47401	WAKKANAI, JAPAN	1	45.42	-141.68	166
47412	SAPPORO, JAPAN	0	43.05	-141.33	166
47420	NEMURO, JAPAN	1	43.33	-145.58	166
47580	MISAWA AB, JAPAN	1	40.68	-141.38	166
47582	AKITA, JAPAN	1	39.72	-140.10	130
47590	SENDAI, JAPAN	1	38.27	-140.90	130
47600	WAJIMA, JAPAN	1	37.38	-136.90	131
47646	TATENO, JAPAN	0	36.05	-140.13	130
47678	HACHIJOJIMA, JAPAN	1	33.12	-139.78	131
47681	HAMAMATSU AB, JAPAN	1	34.73	-137.67	131
47744	YONAGO, JAPAN	1	35.43	-133.35	131
47778	SHIONOMISAKI, JAPAN	1	33.45	-135.77	131
47807	FUKUOKA, JAPAN	1	33.58	-130.38	131
47827	KAGOSHIMA, JAPAN	1	31.63	-130.58	131
47881	TOKUSHIMA AB, JAPAN	1	34.13	-134.60	131
47909	NAZE, JAPAN	1	28.38	-129.55	96
47918	ISHIGAKIJIMA, JAPAN	1	24.33	-124.17	96
47931	KADENA AB, JAPAN	1	26.40	-127.80	96
47936	NAHA/KAGAMIZU, JAPAN	1	26.20	-127.67	96
47945	MINAMIDAITOJIMA, JAPAN	1	25.83	-131.23	95
47971	CHI CHI JIMA, JAPAN	0	27.08	-142.18	94
47991	MINAMITORISHIMA, JAPAN	0	24.30	-153.97	93
48327	CHIANG MAI, THAILAND	0	18.78	-98.98	63
48354	UDORN THANI, THAILAND	0	17.37	-102.80	62
48407	UBON RATCHATHANI (UU), THAILAND	0	15.25	-104.87	62
48455	BANGKOK, THAILAND	1	13.73	-100.50	62
48568	SONGKHLA, MALAYSIA	1	7.20	-100.60	26
48601	PENANG/BAYAN LEPAS, MALAYSIA	1	5.30	-100.27	26
48615	KOTA BHARU/PENGKLAN, MALAYSIA	1	6.17	-102.28	26
48647	KUALA LUMPUR/SUBANG, MALAYSIA	0	3.12	-101.55	26
48657	KUANTAN/BESERAH, MALAYSIA	1	3.78	-103.22	26
48694	SINGAPORE AIRPORT, SINGAPORE	1	1.37	-103.92	26
48849	DONG HA, VIET NAM	0	16.80	-107.10	62
48855	DA-NANG/TOURANE (SD), CENTRAL VIET NAM	1	16.03	-108.18	62
48896	BIEN-HOA, CENTRAL VIET NAM	0	11.00	-106.80	62
48900	SAIGON/TANSONNHUT (VS), SOUTH VIET NAM	0	10.82	-106.67	62
50527	HULUN/HAILAR, CHINA	0	49.22	-119.75	169
50557	NAUKIANG, CHINA	0	49.17	-125.22	168
50774	YICHUN, CHINA	0	47.72	-128.90	168
50953	HARBIN, CHINA	0	45.68	-126.62	168

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
51076	ALEITAI, CHINA	0	47.73	-88.08	172
51133	T'A-CH'ENG, CHINA	0	46.73	-83.00	172
51243	ANGIRIA, CHINA	0	45.60	-84.85	172
51288	PEI TA HSHAN, CHINA	0	45.37	-90.53	171
51431	INING, CHINA	0	43.95	-81.33	172
51463	WULUMUCHI, CHINA	0	43.90	-87.47	172
51644	KUCHE, CHINA	0	41.72	-82.95	172
51656	K'U-ERH-LC, CHINA	0	41.75	-86.13	172
51709	SU LO/SHU LEH, CHINA	0	39.47	-75.98	137
51777	NOCHIANG, CHINA (MAINLAND)	0	39.03	-88.17	136
51828	HOTIEN, CHINA	0	37.13	-79.93	137
51886	MANG-YAI-CHEN, CHINA	0	38.37	-90.15	135
52203	HAMI, CHINA	0	42.82	-93.52	171
52267	SOH KUO NOR, CHINA	0	41.98	-101.07	170
52323	YEMAJIE, CHINA	0	41.63	-96.88	171
52391	PANG-TING-TO-TO-KAI, CHINA	0	41.70	-104.00	170
52418	TUNHWANG, CHINA	0	40.13	-94.78	171
52495	BAYAN MOO, CHINA	0	40.75	-104.50	170
52533	CHIUCHUAN, CHINA	0	39.77	-98.52	135
52602	ANGIR TOLOGOI, CHINA	0	38.83	-93.38	135
52652	CHANG YEN, CHINA	0	38.93	-100.58	134
52681	MINCHIN, CHINA	0	38.72	-103.10	134
52818	KARMU, CHINA	0	36.20	-94.63	135
52836	CHAHANWUSU, CHINA	0	36.33	-98.03	135
52866	SINING, CHINA	0	36.75	-101.60	134
52889	LANCHOW, CHINA	0	36.05	-103.88	134
53068	ERHLIEN, CHINA	0	43.65	-112.00	169
53336	HAILUT, CHINA	0	41.67	-108.80	170
53463	HUHEHOT, CHINA	0	40.82	-111.68	169
53513	TENGKOW, CHINA	0	40.77	-107.40	170
53543	TUNG SHENG, CHINA	0	39.83	-109.98	134
53614	YINCHWAN, CHINA	0	38.48	-106.22	134
53772	TAIYUAN, CHINA	0	37.78	-112.55	133
53798	NEI CHIU, CHINA	0	37.07	-114.50	133
53845	YENAN, CHINA	0	36.60	-109.50	134
53915	PINGLIANG, CHINA	0	35.55	-106.67	134
54102	HSILINHOT, CHINA	0	43.95	-116.07	169
54135	TUNGLIAO, CHINA	0	43.60	-122.27	168
54161	CHANGCHUN, CHINA	0	43.90	-125.22	168
54218	CHIHFENG, CHINA	0	42.27	-118.97	169
54292	YENCHI, CHINA	0	42.88	-129.47	168
54337	CHINCHOW, CHINA	0	41.13	-121.12	168
54342	SHENYANG, CHINA	0	41.82	-123.55	168
54374	LINCHIANG, CHINA	0	41.72	-126.92	168
54401	ZHANGJIAKOU, CHINA	0	40.78	-114.88	169
54497	ANTUNG, CHINA	0	40.05	-124.33	168
54511	PEKING, CHINA	0	39.80	-116.47	133
54662	TALIEN, CHINA	1	38.98	-121.63	132
54823	CHINAN, CHINA	0	36.68	-116.98	133
54857	TSINGTAO, CHINA	1	36.07	-120.33	132
55299	HEIHO, CHINA	0	31.48	-92.05	135

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55591	LASA, CHINA	0	29.70	-91.13	99
56004	TO TU HO YEN, CHINA	0	33.95	-92.62	135
56029	YUSHU (P), CHINA	0	33.10	-96.75	135
56046	CHINAI, CHINA	0	33.80	-99.80	135
56080	HA TUNG, CHINA	0	34.92	-103.07	134
56096	WOUTOU, CHINA	0	33.38	-104.68	134
56137	CHANGTU, CHINA	0	31.18	-96.98	135
56146	KANTZE, CHINA	0	31.63	-99.98	135
56294	CHENGTU, CHINA	0	30.67	-104.02	134
56444	DEHCHIN, CHINA	0	28.65	-99.17	99
56492	I PIN/YEHPIN, CHINA	0	28.82	-104.53	98
56571	HSIHCHANG, CHINA	0	27.88	-102.30	98
56651	LICHIANG, CHINA	0	26.87	-100.43	98
56691	WEI NING, CHINA	0	26.87	-104.28	98
56739	TENG CHUNG, CHINA	0	25.12	-98.48	99
56778	KUNMING, CHINA	0	25.02	-102.68	98
56964	SZEMOA, CHINA	0	22.67	-101.40	98
56989	HOKOW, CHINA	0	22.50	-103.95	98
57036	SIAN, CHINA	0	34.30	-108.93	134
57083	CHENG CHOW, CHINA	0	34.72	-113.65	133
57127	HANCHUNG, CHINA	0	33.07	-107.03	134
57178	NANYANG, CHINA	0	30.03	-112.58	133
57245	ANKANG, CHINA	0	32.72	-109.03	134
57290	HSIN YANG, CHINA	0	32.97	-114.05	133
57328	DAHSIEN, CHINA	0	31.27	-107.47	134
57447	ENSHIH, CHINA	0	30.27	-109.37	134
57461	YEHCHANG, CHINA	0	30.70	-111.08	133
57494	HANKOW, CHINA	0	30.63	-114.07	133
57515	SAPINPA, CHINA	0	29.52	-106.48	98
57679	CHANGSHA, CHINA	0	28.20	-113.07	97
57745	CHIHKIANG, CHINA	0	27.45	-109.63	98
57816	KWEIYANG, CHINA	0	26.58	-106.72	98
57957	KWEILIN, CHINA	0	25.33	-110.30	97
57972	CHENGHSIEN, CHINA	0	25.75	-112.98	97
57993	KANCHOW, CHINA	0	25.83	-114.83	97
58027	HSUCHOW, CHINA	0	34.28	-117.30	133
58150	NAN-YANG-AN/YEN-CH, CHINA	0	33.77	-120.25	132
58203	FOU YANG/FUYANG YINGCHOW, CHINA	0	32.93	-115.83	133
58238	NANCHING, CHINA	0	32.00	-118.80	133
58367	SHANGHAI, CHINA	0	31.17	-121.43	132
58424	ANCHING, CHINA	0	30.52	-117.03	133
58457	HANGCHOW, CHINA	0	30.23	-120.17	132
58606	NANCHANG, CHINA	0	28.67	-115.97	97
58633	CHUNCHOW, CHINA	0	28.97	-118.87	97
58666	TA CHEN TAO, CHINA	1	28.45	-121.88	96
58725	SHAO WU, CHINA	0	27.33	-117.47	97
58847	FUCHOW, CHINA	0	26.08	-119.28	97
59023	HECHI, CHINA	0	24.70	-108.05	98
59096	LIEN PING, CHINA	0	24.37	-114.48	97
59134	SHAMEN, CHINA	1	24.45	-118.07	97
59211	POSEH, CHINA	0	23.92	-106.53	98

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
59265	WUCHOW, CHINA	0	23.48	-111.30	97
59287	KUANGCHOW, CHINA	0	23.13	-113.32	97
59316	SHANTOU, CHINA	1	23.40	-116.68	97
59431	NANNING, CHINA	0	22.82	-108.35	98
59553	TUNG KONG, CHINA	0	24.15	-120.68	96
59663	YANGCHIANG, CHINA	1	21.87	-111.97	97
59758	HAIKOW, CHINA	1	20.03	-110.35	97
59981	HSI SHA CHOU/PARACEL ISLAND, CHINA	1	16.83	-112.33	61
60020	SANTA CRUZ DE TENERIFE, CANARY ISLANDS	1	28.47	16.25	74
60119	KENITRA II (EX PORT-LYAUTEY), MOROCCO	1	34.30	6.60	109
60155	CASABLANCA, MOROCCO	1	33.57	7.67	109
60250	AGADIR/INEZGANE, MOROCCO	1	30.38	9.57	109
60390	ALGER/DAR EL BEIDA, ALGERIA	1	36.72	-3.25	144
60571	BECHAR, ALGERIA	0	31.63	2.25	109
60580	OUARGLA, ALGERIA	0	31.90	-5.40	144
60630	IN SALAH, ALGERIA	0	27.20	-2.47	108
60680	TAMANRASSET, ALGERIA	0	22.78	-5.52	108
60715	TUNIS CARTHAGE, TUNISIA	1	36.83	-10.23	143
60760	TOZEUR, TUNISIA	0	33.92	-8.17	144
61052	NIAMEY-AERO, NIGER	0	13.48	-2.17	72
61223	TOMBOUCTOU, MALI	0	16.72	3.00	37
61290	BAMAKO, MALI	0	12.63	8.03	37
61415	PORT-ETIENNE, MAURITANIA	1	20.93	17.03	74
61641	DAKAR/YOFF, SENEGAL	1	14.73	17.50	38
61902	WIDE AWAKE FLD-ASCENSION IS., OCEAN ISLANDS	1	-7.97	14.40	301
61967	DIEGO GARCIA, OCEAN ISLANDS	1	-7.35	-72.48	328
61995	VACOAS (MAURITIUS), OCEAN ISLANDS	1	-20.30	-57.50	402
61996	ILE NOUVELLE-AMSTERDAM, OCEAN ISLANDS	1	-37.80	-77.53	436
61998	PORT-AUX-FRANCAIS (ILES KERGUELEN),OCEAN IS	1	-49.33	-70.22	472
62010	IDRIS, LIBYA	0	32.68	-13.17	143
62011	WHEELUS FIELD, LIBYA	1	32.90	-13.30	143
62053	BENGHAZI/BENINA, LIBYA	1	32.08	-20.27	142
62062	TOBRUK, LIBYA	1	32.10	-24.00	142
62306	MERSA MATRUH, UNITED ARAB REPUBLIC (EGYPT)	1	31.32	-27.22	142
62378	HELWAN, UNITED ARAB REPUBLIC (EGYPT)	0	29.87	-31.33	105
62414	ASWAN, UNITED ARAB REPUBLIC (EGYPT)	0	23.97	-32.82	105
62641	PORT SUDAN, SUDAN	1	19.58	-37.22	69
62721	KHARTOUM, SUDAN	0	15.60	-32.55	69
63450	ADDIS ABABA, ETHIOPIA	0	8.98	-38.80	33
63705	ENTEBBE AIRPORT, UGANDA	0	.05	-32.45	33
63741	NAIROBI/DAGORETTI, KENYA	0	-1.30	-36.75	332
63894	DAR ES SALAAM AIRPORT, TANZANIA	1	-6.88	-39.20	332
64650	BANGUI, CENTRAL AFRICAN REPUBLIC	0	4.40	-18.52	35
64700	FORT-LAMY, CHAD	0	12.13	-15.03	71
64910	DOUALA, CAMEROON	1	4.02	-9.70	36
65046	KANO, NIGERIA	0	12.05	-8.53	72
65202	LAGOS OSHODI, NIGERIA	1	6.55	-3.35	36
65578	ABIDJAN, IVORY COAST	1	5.25	3.93	1
66160	LUANDA, ANGOLA	1	-8.85	-13.23	334
66285	LUSO, ANGOLA	0	-11.78	-19.92	370
66390	SA DA BANDERIA, ANGOLA	0	-14.93	-13.58	370

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
67083	TANANARIVE/IVATO, MALAGASY REPUBLIC	0	-18.80	-47.48	367
67085	TANANARIVE, MALAGASY REPUBLIC	0	-18.90	-47.50	367
67197	FT DAUPHIN, MALAGASY REPUBLIC	1	-25.03	-46.95	403
67237	NAMPULA, MOZAMBIQUE	0	-15.10	-39.28	368
67341	LOURENGO MARQUES/GAGO COUTINHO, MOZAMBIQUE	1	-25.92	-32.57	404
67663	BROKEN HILL, ZAMBIA	0	-14.45	-28.47	369
68014	GROOTFONTEIN, SOUTH AFRICA	0	-19.60	-18.13	370
68112	J. G. STRIJDOM, SOUTH WEST AFRICA	0	-22.48	-17.47	406
68262	PRETORIA, SOUTH AFRICA	0	-25.57	-28.22	405
68263	PRETORIA/IRENE, SOUTH AFRICA	0	-25.92	-28.22	405
68406	ALEXANDER BAY, SOUTH WEST AFRICA	1	-28.57	-16.53	406
68442	BLOEMFONTEIN (J.B.M.HERTZOG), SOUTH AFRICA	0	-29.10	-26.30	405
68588	DURBAN (LOUIS BOTHA), SOUTH AFRICA	1	-29.97	-30.95	404
68816	CAPE TOWN (D.F. MALAN), SOUTH AFRICA	0	-33.97	-18.60	442
68842	PORT ELIZABETH, SOUTH AFRICA	1	-33.98	-25.60	441
68906	GOUGH ISLAND, SOUTH ATLANTIC OCEAN	1	-40.35	9.88	444
68994	MARION ISLAND, SOUTH AFRICA	1	-46.88	-37.87	476
70026	BARROW, ALASKA	1	71.30	156.78	268
70086	BARTER ISLAND, ALASKA	1	70.13	143.63	267
70133	KOTZEBUE, ALASKA	1	66.87	162.63	233
70200	NOME, ALASKA	1	64.50	165.43	233
70219	BETHEL, ALASKA	0	60.78	161.80	233
70231	MCGRATH, ALASKA	0	62.97	155.62	232
70261	FAIRBANKS/INT., ALASKA	0	64.82	147.87	231
70273	ANCHORAGE/INT., ALASKA	0	61.17	150.02	232
70308	ST. PAUL IS., ALASKA	1	57.15	170.22	198
70316	COLD BAY, ALASKA	1	55.20	162.72	197
70326	KING SALMON, ALASKA	1	58.68	156.65	196
70350	KODIAK/NAS, ALASKA	1	57.75	152.52	196
70361	YAKUTAT, ALASKA	1	59.52	139.67	194
70398	ANNETTE ISLAND, ALASKA	1	55.03	131.57	194
70414	SHEMYA, ALASKA	1	52.72	-174.10	199
70454	ADAK, ALASKA	1	51.88	176.65	198
72201	KEY WEST/INT., FLA.,USA	1	24.58	81.70	81
72202	MIAMI/INT., FLA.,USA	1	25.80	80.27	81
72206	JACKSONVILLE/IMESON, FLA.,USA	1	30.40	81.70	117
72208	CHARLESTON/MUN., S.C., USA	1	32.90	80.03	117
72211	TAMPA/INT., FLA.,USA	1	27.97	82.53	81
72213	WAYCROSS/WARE CO., GEORGIA, U.S.A.	0	31.25	82.40	117
72220	APALACHICOLA, FLORIDA, U.S.A.	1	29.73	84.98	81
72221	EGLIN AFB, FLA.,USA	1	30.48	86.52	117
72225	LAWSON AAF, GEORGIA, USA	0	32.20	84.50	117
72226	MONTGOMERY/DANNELLY, ALA.,USA	0	32.30	86.40	117
72228	BIRMINGHAM, ALABAMA, U.S.A.	0	33.57	86.75	117
72232	BOOTHVILLE, LA.,USA	1	29.33	89.40	81
72235	JACKSON/THOMPSON, MISS.,USA	0	32.32	90.08	118
72240	LAKE CHARLES/MUN., LA.,USA	0	30.12	93.22	118
72243	HOUSTON INTCNTL, TEXAS, U.S.A.	0	29.97	95.35	82
72248	SHREVEPORT/MUN., LA.,USA	0	32.47	93.82	118
72250	BROWNSVILLE/R.G.V.INT., TEX.,USA	1	25.90	97.43	82
72255	VICTORIA/FOSTER, TEX.,USA	0	28.85	96.92	82

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72257	FT. HOOD AAF, TEXAS, UNITED STATES	0	31.10	97.33	118
72259	FT.WORTH/GREATER FT.WORTH INT., TEX.,USA	0	32.77	97.42	118
72260	STEPHENVILLE, TEXAS, U.S.A.	0	32.22	98.18	118
72261	DEL RIO/INT., TEX.,USA	0	29.37	100.92	83
72265	MIDLAND/AIR TERM., TEX.,USA	0	31.95	102.18	119
72266	ABILENE/MUN., TEX.,USA	0	32.43	99.68	118
72270	EL PASO/INT., TEX.,USA	0	31.80	106.40	119
72274	TUCSON/INT., ARIZ.,USA	0	32.12	110.93	120
72280	YUMA/YUMA INT., ARIZ.,USA	0	32.67	114.60	120
72290	SAN DIEGO/LINDBERG, CALIF.,USA	1	32.82	117.13	120
72291	SAN NICOLAS IS./NF, CALIF.,USA	1	33.25	119.45	120
72295	LOS ANGELES/INT., CALIF.,USA	1	33.93	118.40	120
72304	CAPE HATTERAS, N.C.,USA	1	35.27	75.55	116
72311	ATHENS/BEN EPPS FIELD, GA.,USA	0	33.95	83.32	117
72317	GREENSBORO/G.-HIGH POINT, N.C.,USA	0	36.08	79.95	116
72327	NASHVILLE/METROPOLITAN, TENN.,USA	0	36.25	86.57	117
72340	LITTLE ROCK/ADAMS, ARK.,USA	0	34.73	92.23	118
72349	MONETT, MISSOURI, U.S.A.	0	36.88	93.90	118
72353	OKLAHOMA CITY/W.ROGERS WORLD, OKLA.,USA	0	35.40	97.60	118
72354	TINKER AFB, OKLA.,USA	0	35.42	97.38	118
72355	FT. SILL, OKLAHOMA, USA	0	34.60	98.40	118
72357	NORMAN/MAX WESTHEIM, OKLAHOMA, U.S.A.	0	35.23	97.47	118
72363	AMARILLO/AIR TERM., TEX.,USA	0	35.23	101.70	119
72365	ALBUQUERQUE/SUNPORT-KIRTLAND AFB,N.MEX.,USA	0	35.05	106.62	119
72374	WINSLOW/MUN., ARIZ.,USA	0	35.02	110.73	120
72381	EDWARDS AFB, CALIF.,USA	0	34.92	117.90	120
72385	YUCCA FLAT, NEV.,USA	0	36.95	116.05	120
72386	LAS VEGAS/MCCARRAN, NEVADA, U.S.A.	0	36.10	115.20	120
72389	FRESNO/AIR TERM., CALIF.,USA	0	36.77	119.72	120
72391	POINT MUGU/NAS, CALIFORNIA, U.S.A.	1	34.12	119.12	120
72393	VANDENBERG AFB, CALIF.,USA	1	34.75	120.57	121
72402	WALLOPS ISLAND, VA.,USA	1	37.85	75.48	116
72403	WASHINGTON/DULLES INT., VA.,USA	0	38.98	77.47	116
72408	PHILADELPHIA INTL, PENNSYLVANIA, U.S.A.	0	39.88	75.25	116
72414	CHARLESTON/KANAWHA, WEST VIRGINIA, U.S.A.	0	38.37	81.60	117
72425	HUNTINGTON/TRI-STATE, W.VA.,USA	0	38.37	82.55	117
72429	DAYTON/COX-DAYTON MUN., OHIO,USA	0	39.87	84.12	117
72433	SALEM-LECKRONE, ILLINOIS, U.S.A.	0	38.65	88.97	117
72445	COLUMBIA, MO.,USA	0	39.00	92.40	118
72451	DODGE CITY/MUN., KANS.,USA	0	37.77	99.97	118
72456	TOPEKA/MUN., KANS.,USA	0	39.07	95.63	118
72468	BUTTS AAF, GEORGIA, USA	0	38.70	104.77	119
72469	DENVER/STAPLETON, COLO.,USA	0	39.75	104.87	119
72476	GRAND JUNCTION/WALKER, COLO.,USA	0	39.12	108.53	119
72486	ELY/YELLAND, NEV.,USA	0	39.28	114.85	120
72493	OAKLAND/UAU, CALIF.,USA	1	37.73	122.20	121
72506	NANTUCKET/MEMORIAL, MASS.,USA	1	41.30	70.10	152
72518	ALBANY/ALBANY CO., N.Y.,USA	0	42.75	73.80	152
72520	PITTSBURGH/GREATER PITTSBURGH, PA.,USA	0	40.53	80.23	153
72528	BUFFALO/GREATER BUFFALO INT., N.Y.,USA	1	42.93	78.73	152
72532	PEORIA/GREATER PEORIA, ILL.,USA	0	40.67	89.68	153

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72534	CHICAGO-MIDWAY, ILLINOIS, U.S.A.	1	41.78	87.75	153
72553	OMAHA/NORTH OMAHA, NEBR.,USA	0	41.37	96.02	154
72562	NORTH PLATTE/LEE BIRD, NEBR.,USA	0	41.13	100.68	155
72572	SALT LAKE CITY/MUN., UTAH,USA	0	40.77	111.97	156
72576	LANDER/HUNT, WYO.,USA	0	42.82	108.73	155
72583	WINNEMUCCA/MUN., NEV., USA	0	40.90	117.80	156
72597	MEDFORD/MEDFORD-JACKSON COUNTY, OREG.,USA	0	42.37	122.87	157
72600	SABLE ISLAND, N.S.,CANADA	1	43.93	60.02	151
72606	PORTLAND/MUN., MAINE,USA	1	43.65	70.32	152
72637	FLINT/BISHOP, MICH.,USA	0	42.97	83.73	153
72645	GREEN BAY/A.STRAUBEL, WIS.,USA	0	44.48	88.13	153
72654	HURON/HOWES MUN., S.DAK.,USA	0	44.38	98.22	154
72655	ST. CLOUD/WHITNEY, MINN.,USA	0	45.58	94.07	154
72662	RAPID CITY/MUN., S.DAK.,USA	0	44.05	103.07	155
72681	BOISE/MUN., IDAHO,USA	0	43.57	116.22	156
72694	SALEM/MONARY, OREG.,USA	0	44.92	123.02	157
72701	GAGETOWN, CANADA	0	45.83	66.43	151
72712	CARIBOU/MUN., MAINE,USA	0	46.87	68.02	151
72722	MANIWAKI, QUE.,CANADA	0	46.37	75.98	152
72734	SAULT STE. MARIE, MICH.,USA	1	46.47	84.37	153
72747	INTERNATIONAL FALLS, MINN.,USA	0	48.57	93.38	154
72764	BISMARCK/MUN., N.DAK.,USA	0	46.77	100.75	155
72768	GLASGOW/INT., MONT.,USA	0	48.22	106.62	155
72775	GREAT FALLS/INT., MONT.,USA	0	47.48	111.37	156
72785	SPOKANE/INT., WASH.,USA	0	47.63	117.53	156
72793	SEATTLE/TACOMA INTL, WASH., U.S.A.	1	47.45	122.30	157
72797	QUILLAYUTE, WASH.,USA	0	47.95	124.55	157
72798	TATOOSH ISLAND, WASHINGTON, U.S.A.	1	48.40	124.70	157
72801	ST JOHNS/TORBAY, CANADA	1	47.07	52.75	150
72807	ARGENTIA, NFLD.,CANADA	1	47.30	54.00	150
72811	SEPT-ILES (SEVEN ISLANDS) QUE.,CANADA	1	50.22	66.27	187
72815	STEPHENVILLE, NFLD.,CANADA	1	48.53	58.55	150
72816	GOOSE, NFLD.,CANADA	0	53.32	60.42	187
72826	NITCHEQUON, QUE.,CANADA	0	53.20	70.90	188
72836	MOOSONEE, ONT.,CANADA	1	51.27	80.65	189
72848	TROUT LAKE, ONT.,CANADA	0	53.83	89.87	189
72853	CAMP SHILO, MAN., CANADA	0	49.82	99.65	154
72867	THE PAS, MAN.,CANADA	0	53.97	101.10	191
72896	PRINCE GEORGE, B.C.,CANADA	0	53.88	122.68	193
72906	FORT CHIMO, QUE.,CANADA	1	58.10	68.42	187
72907	INOUCDJOUAC, QUE.,CANADA	1	58.45	78.12	188
72909	FROBISHER BAY, N.W.T.,CANADA	0	63.75	68.55	223
72913	CHURCHILL, MAN.,CANADA	1	58.75	94.07	190
72915	CORAL HARBOUR, N.W.T.,CANADA	1	64.20	83.37	225
72917	EUREKA, N.W.T.,CANADA	1	80.00	85.93	297
72924	RESOLUTE, N.W.T.,CANADA	1	74.72	94.98	262
72925	CAMBRIDGE BAY, N.W.T., CANADA	1	69.10	105.12	227
72926	BAKER LAKE, N.W.T.,CANADA	0	64.30	96.00	226
72928	ROCKY MTN HOUSE, CANADA	0	52.38	114.92	192
72934	FORT SMITH, N.W.T.,CANADA	0	60.02	111.97	228
72938	COPPERMINE, N.W.T.,CANADA	1	67.80	115.10	228

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
72945	FORT NELSON, B.C., CANADA	0	58.83	122.58	193
72957	INUVIK, N.W.T., CANADA	0	68.30	133.48	230
72964	WHITEHORSE, Y.T., CANADA	0	60.72	135.07	230
74043	NORMAN WELLS, N.W.T., CANADA	0	65.28	126.80	229
74051	SACHS HARBOUR, N.W.T., CANADA	1	71.98	125.28	265
74072	MOULD BAY, N.W.T., CANADA	1	76.23	119.33	264
74074	ISACHSEN, N.W.T., CANADA	1	78.78	103.53	263
74081	HALL BEACH, N.W.T., CANADA	1	68.78	81.25	225
74082	ALERT, N.W.T., CANADA	1	82.50	62.33	907
74090	CLYDE, N.W.T., CANADA	1	70.50	68.60	259
74109	PORT HARDY, B.C., CANADA	1	50.68	127.37	193
74115	VERNON BRIDGE, CANADA	0	.23	119.28	192
74119	EDMONTON (STONY PLAIN), ALTA., CANADA	0	53.55	114.10	192
74399	SHELBURNE, CANADA	1	43.72	65.25	151
74486	NEW YORK/JOHN F. KENNEDY INT., N.Y., USA	1	40.65	73.78	152
74494	CHATHAM, MASS., U.S.A.	1	41.67	69.97	151
74704	EL MONTE EMSU, CALIFORNIA, U.S.A.	1	34.08	118.03	120
74794	CAPE KENNEDY, FLORIDA, USA	1	28.47	80.55	81
76151	ISLA GUADALUPE, MEXICO	1	29.17	118.32	84
76225	CHIHUAHUA, CHIH., MEXICO	0	28.70	106.07	83
76256	FRACCIONAMIENTO LIB, MEXICO	0	27.95	110.80	84
76394	MONTERREY, N.L., MEXICO	0	25.87	100.23	83
76458	MAZATLAN, SIN., MEXICO	1	23.18	105.42	83
76644	MERIDA, YUC., MEXICO	0	20.95	89.67	81
76679	MEXICO CITY, D.F., MEXICO	0	19.43	99.07	46
76692	VERACRUZ, VER., MEXICO	1	19.15	96.12	46
76723	ISLAND SOCORRA, MEXICO	1	18.72	110.95	48
78016	KINDLEY FIELD AFB, ST.GEORGE'S, BERMUDA	1	32.37	64.68	115
78063	GOLD ROCK CREEK, GRAND BAHAMA IS. BAHAMAS	1	26.60	78.30	80
78076	COFFIN HILLS, ELEUTHERA ISLAND, BAHAMAS	1	25.30	76.30	80
78118	TURKS ISLAND (AUX. AFB), TURKS ISLANDS	1	21.45	71.15	80
78325	CASA BLANCA, CUBA	1	23.15	82.35	81
78355	CAMAGUEY, CAMAGUEY, CUBA	0	21.40	77.90	80
78367	GUANTANAMO, ORIENTE, CUBA	1	19.90	75.15	44
78384	ROBERTS FIELD, GRAND CAYMAN, CAYMAN ISLANDS	1	19.32	81.35	45
78397	KINGSTON/PALISADOES, JAMAICA	1	18.07	76.85	44
78486	SANTO DOMINGO, DOMINICAN REPUBLIC	1	18.47	69.88	43
78501	SWAN ISLAND, SWAN ISLAND	1	17.40	83.93	45
78526	SAN JUAN/INT., PUERTO RICO	1	18.43	66.00	43
78641	GUATEMALA/LA AURORA, GUATEMALA	0	14.58	90.52	46
78724	CHOLUTECA, HONDURAS	0	13.30	87.20	45
78762	SAN JOSE/SANTAMARIA, COSTA RICA	0	9.98	84.22	9
78806	HOWARD AIR FORCE BASE, CANAL ZONE	1	8.97	79.60	8
78861	COOLIDGE FIELD, ANTIGUA, BRITISH ISLANDS	1	17.12	61.78	43
78866	JULIANA AIRPORT, ST. MARTIN	1	18.05	63.12	43
78897	RAIZET, GUADELUPE, LA GUADELOUPE	1	16.27	61.52	43
78954	SEAWELL AIRPORT, BARBADOS	1	13.07	59.48	42
78967	CHAGUARAMAS, TRINIDAD	1	10.70	61.60	43
78970	PIARCO/PORT OF SPAIN, TRINIDAD + TOBAGO	1	10.62	61.35	43
78988	DR. A. PLESMAN AIRPORT, CURACAO	1	12.20	68.97	43
80001	SAN ANDRES, COLOMBIA	1	12.58	81.70	45

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
80222	BOGOTA/ELDORADO, COLOMBIA	0	4.70	74.13	8
80413	MARACAY-B.A.SUATE, VENEZUELA	0	10.25	67.65	43
80447	SAN ANTONIO, VENEZUELA	0	7.85	72.45	8
81403	KOURON, FRENCH GUIANA	1	5.20	52.70	6
81405	CAYENNE/ROCHAMBEAU, FRENCH GUIANA	1	4.83	52.37	6
82193	BELEM (VAL DE CAS), BRAZIL	1	-1.38	48.48	304
82280	SAO LUIZ, BRAZIL	1	-2.53	44.28	304
82332	MANAUS (PONTA PELADA), BRAZIL	0	-3.15	59.98	305
82397	FORTALEZA, BRAZIL	1	-3.72	38.55	303
82400	FERNANDO NORONHA, BRAZIL	1	-3.85	32.42	303
82599	NATAL (AUGUSTO SEVERO), BRAZIL	1	-5.92	35.25	303
82678	FLORIANO/CANGAPARA, BRAZIL	0	-6.77	43.02	304
82765	CAROLINA, BRAZIL	0	-7.03	47.47	304
82900	RECIFE CURADO, BRAZIL	1	-8.07	34.92	303
82983	PETROLINA, BRAZIL	0	-9.38	40.50	304
83208	VILHENA (AEVOPORTO), BRAZIL	1	-12.73	60.13	342
83229	SALVADOR (ONDINA), BRAZIL	1	-13.00	38.52	339
83288	BOM JESUS DA LAPA, BRAZIL	0	-13.27	43.42	340
83378	BRASILIA (AIRPORT), BRAZIL	0	-15.87	47.93	340
83612	CAMPO GRANDE (AIRPORT), BRAZIL	0	-20.47	54.67	377
83650	TRINDADE (ISLAND), BRAZIL	1	-20.50	29.32	374
83746	RIO JANEIRO/AEROPORTO GALEAO, BRAZIL	1	-22.82	43.25	376
83780	SAO PAULO/CONGONHAS, BRAZIL	0	-23.62	46.65	376
83840	CURITTIBA (ALFONSO PENA), BRAZIL	0	-25.52	49.17	376
83971	PORTO ALEGRE (SALGADO FILHO), BRAZIL	1	-30.00	51.18	413
84008	SAN CRISTOBAL (GALAPAGOS), ECUADOR	1	-.90	89.62	308
84129	GUAYAQUIL/SIMON BOLIVAR, ECUADOR	0	-2.20	79.88	307
84628	LIMA-CALLAO (INT. AIRPORT), PERU	1	-12.00	77.12	343
84631	LIMATAMBO, PERU	1	-12.10	77.00	343
85442	ANTOFAGASTA/CERRO MORENO, CHILE	1	-23.43	70.47	379
85469	ISLA DE PASCUA, CHILE	1	-27.17	109.43	382
85543	QUINTERO, CHILE	1	-32.78	71.53	415
85799	PUERTO MONTT/EL TEP, CHILE	1	-41.47	72.93	451
85801	PUERTO MONTT/LA CHAMIZA, CHILE	1	-41.50	72.90	451
87047	SALTA, ARGENTINA	0	-24.85	65.48	378
87155	RESISTENCIA AEROP. INT., ARGENTINA	0	-27.45	59.05	377
87344	CORDOBA, ARGENTINA	0	-31.32	64.22	414
87418	MENDOZA/EL PLUMERIL, ARGENTINA	0	-32.83	68.78	414
87420	OBSERVATORIO MENDOZA, ARGENTINA	0	-32.88	68.85	414
87576	EZEIZA, ARGENTINA	1	-34.82	58.53	413
87623	SANTA ROSA AERO, ARGENTINA	0	-36.57	64.27	414
87715	NEUQUEN, ARGENTINA	0	-38.95	68.13	414
87748	BASE AERONAVAL COMMANDANTE ESPORA, ARGENTINA	1	-38.73	62.17	414
87860	COMODORO RIVADAVIA, ARGENTINA	1	-45.78	67.45	450
87926	STACION AERONAVAL DE RIO GALLEGOS, ARGENTIA	1	-51.63	69.22	486
87938	ESTACION AERONAVAL USHUAIA, ARGENTINA	1	-54.80	68.30	486
88952	ARGENTINE ISLANDS	1	-65.25	64.27	522
88968	ISLAS ORCADAS ISLANDS	1	-60.75	44.72	520
89001	S.A.N.A.E. STATION, ANTARCTICA	1	-70.32	2.37	552
89009	AMUNDSEN-SCOTT, ANTARCTICA	0	-90.00	.00	588
89022	HALLEY BAY, ANTARCTICA	1	-75.52	26.60	554

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
89050	BELLINGHAUSEN, ANTARCTICA	1	-62.20	58.93	521
89125	BYRD STATION, ANTARCTICA	0	-80.02	119.53	599
89512	NOVOLAZAREVSKAJA, ANTARCTICA	0	-70.77	-111.83	576
89532	SYOWA, ANTARCTICA	1	-69.00	-39.58	548
89542	MOLODEZNAJA, ANTARCTICA	1	-67.67	-45.85	547
89571	DAVIS, ANTARCTICA	1	-68.58	-77.98	544
89592	MIRNYJ, ANTARCTICA	1	-66.55	-93.02	542
89606	VOSTOK, ANTARCTICA	0	-78.45	-106.87	577
89611	WILKES, ANTARCTICA	1	-66.25	-110.53	540
89664	MCMURDO, ANTARCTICA	1	-77.85	-166.67	571
91030	CHICHI JIMA ISLAND, PACIFIC OCEAN	1	27.10	-142.30	94
91066	MIDWAY ISLAND, PACIFIC OCEAN	1	28.22	177.37	90
91115	CENTRAL AIRFIELD, IWO JIMA	1	24.80	-141.30	94
91131	MARCUS ISLAND, PACIFIC OCEAN	1	24.30	-154.00	93
91165	LIHUE, KAUAI, HAWAII	1	21.98	159.35	88
91217	GUAM, TAGUAC, MARIANA IS.	1	13.55	-144.83	58
91245	WAKE ISLAND	1	19.28	-166.65	56
91250	ENIWETOK ATOLL, MARSHALL IS.	1	11.40	-162.40	56
91275	JOHNSTON ISLAND	1	16.73	169.52	53
91285	HILO/GEN.LYMAN, HAWAII	1	19.72	155.07	52
91334	TRUK, CAROLINE IS.	1	7.47	-151.85	21
91348	PONAPE, EASTERN CAROLINE IS.	1	6.97	-158.22	21
91366	KWAJALEIN, MARSHALL IS.	1	8.72	-167.73	20
91376	MAJURO, MARSHALL IS.	1	7.08	-171.38	19
91408	KOROR, PALAU IS.	1	7.33	-134.48	23
91413	YAP, CAROLINE IS.	1	9.48	-138.08	23
91517	HONIARA, BRITISH SOLOMON ISLANDS	1	-9.42	-159.97	320
91558	VILA, NEW HEBRIDES	1	-17.75	-168.30	355
91592	NOUMEA (NLLE-CALEDONIE),NEW CALEDONIA	1	-22.27	-166.45	391
91610	TARAWA, GILBERT ISLANDS	1	1.35	-172.92	19
91643	FUNAFUTI, ELLICE IS.	1	-8.52	-179.22	318
91680	NANDI, FIJI ISLANDS	1	-17.75	-177.45	354
91700	CANTON ISLAND, TOKELAU ISLANDS	1	-2.77	171.72	317
91765	PAGO PAGO/INT.AIRPORT, AMERICAN SAMOA	1	-14.33	170.72	353
91843	RAROTONGA, COOK ISLANDS	1	-21.20	159.82	387
91925	ATUONA, FRENCH OCEANIA	1	-9.82	139.03	313
91938	TAHITI-FAAA, FRENCH OCEANIA	1	-17.55	149.62	350
91944	HAO, FRENCH OCEANIA	1	-18.07	140.95	350
91948	RIKITEA, FRENCH OCEANIA	1	-23.10	134.87	385
91958	RAPA, FRENCH OCEANIA	1	-27.62	144.33	386
93119	AUCKLAND AIRPORT, NEW ZEALAND	1	-37.02	-174.80	426
93337	WAIOURU, NEW ZEALAND	0	-39.47	-175.68	426
93780	CHRISTCHURCH AIRPORT, NEW ZEALAND	1	-43.48	-172.55	462
93844	INVERCARGILL AERODROME, NEW ZEALAND	1	-46.40	-168.33	463
93944	CAMPBELL ISLAND, NEW ZEALAND	1	-52.55	-169.15	499
93986	CHATHAM ISLAND, NEW ZEALAND	1	-43.95	175.57	461
93997	RACUL IS. KERMADEC IS., NEW ZEALAND	1	-29.25	177.92	389
94027	LAE, AUSTRALIAN NEW GUINEA	1	-6.73	-147.00	321
94120	DARWIN AERO, AUSTRALIA	1	-12.43	-130.87	358
94203	BROOME, AUSTRALIA	1	-17.95	-122.22	359
94294	TOWNSVILLE, AUSTRALIA	1	-19.25	-146.77	357

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
94299	WILLIS ISLAND, AUSTRALIAN NEW GUINEA	1	-16.30	-149.98	357
94300	CARNARVON, AUSTRALIA	1	-24.88	-113.65	396
94312	PORT HEDLAND, AUSTRALIA	1	-20.38	-118.62	396
94326	ALICE SPRINGS, AUSTRALIA	0	-23.80	-133.90	394
94335	CLONCURRY, AUSTRALIA	0	-20.67	-140.50	393
94380	GLADSTONE M.O., AUSTRALIA	1	-23.85	-151.27	392
94461	GILES, AUSTRALIA	0	-25.03	-128.30	395
94510	CHARLEVILLE, AUSTRALIA	0	-26.42	-146.28	393
94527	MOREE, AUSTRALIA	0	-29.47	-149.85	393
94578	BRISBANE AIRPORT, AUSTRALIA	1	-27.43	-153.08	392
94610	PERTH AIRPORT, AUSTRALIA	1	-31.92	-115.97	432
94637	KALGOORLIE, AUSTRALIA	0	-30.77	-121.45	431
94638	ESPERANCE M.O., AUSTRALIA	1	-33.82	-121.88	431
94646	FORREST, AUSTRALIA	0	-30.83	-128.10	431
94659	WOOMERA, AUSTRALIA	0	-31.15	-136.80	430
94672	ADELAIDE AIRPORT, AUSTRALIA	1	-34.95	-138.53	430
94711	COBAR M.O., AUSTRALIA	0	-31.53	-145.82	429
94750	NOWRA, AUSTRALIA	1	-34.95	-150.53	428
94776	WILLIAMTOWN, AUSTRALIA	1	-32.82	-151.83	428
94802	ALBANY N.O., AUSTRALIA	1	-34.95	-117.80	432
94821	MT. GAMBIER M.O., AUSTRALIA	0	-37.75	-140.78	429
94865	LAVERTON (AERO), AUSTRALIA	1	-37.87	-144.75	429
94910	WAGGA, AUSTRALIA	0	-35.17	-147.47	429
94975	HOBART AIRPORT, AUSTRALIA	1	-42.83	-147.50	465
94986	MAWSON (AUST.), ANTARCTICA	1	-67.60	-62.88	545
94995	LORD HOWE ISLAND, AUSTRALIA	1	-31.53	-159.08	428
94996	NORFOLK ISLAND, AUSTRALIA	1	-29.05	-167.93	391
94998	MACQUARIE ISLAND, AUSTRALIA	1	-54.50	-158.95	500
95502	DUMONT DURVILLE, ANTARCTICA	1	-66.67	-140.02	537
96471	JESSELTON, NORTH BORNEO, INDONESIA	1	5.95	-116.05	25
96743	DJAKARTA/KEMAJORAN, INDONESIA	1	-6.15	-106.85	325
96996	COCOS ISLAND, INDONESIA	1	-12.18	-96.83	362
98223	LAOAG, PHILIPPINES	1	18.18	-120.53	60
98327	CLARK AFB, PHILIPPINES	0	15.17	-120.57	60
98646	MACTAN INTL, PHILIPPINES	1	10.30	-123.97	60
98836	ZAMBOANGA, PHILIPPINES	1	7.50	-122.12	24
1001	JAN MAYEN, NORWAY	1	70.93	8.67	253
1028	BJORNOYA, NORWAY	1	74.52	-19.02	287
1152	BODO, NORWAY	1	67.25	-14.40	251
1241	ORLAND, NORWAY	1	63.70	-9.43	252
1384	OSLO/GARDERMOEN, NORWAY	0	60.20	-11.10	251
1415	STAVANGER/SOLA, NORWAY	1	58.87	-5.67	216
2057	LULEA/KALLAX, SWEDEN	1	65.55	-22.13	250
2062	OSTERSUND/FROSON, SWEDEN	0	63.18	-14.50	251
2066	SUNDSVALL/HARNOSAND, SWEDEN	1	62.53	-17.45	251
2077	STOCKHOLM/BROMMA, SWEDEN	0	59.35	-17.95	215
2084	BOTEBORG/TORSLANDA, SWEDEN	1	57.72	-11.78	215
2160	TINGSTADE, SWEDEN	1	57.65	-18.35	215
2836	SODANKYLA, FINLAND	0	67.37	-26.65	250
2935	JYVASKYLA/LUONETJARVI, FINLAND	0	62.40	-25.67	250
2963	JOKIOINEN, FINLAND	0	60.82	-23.50	250

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
3005	LERWICK, UNITED KINGDOM	1	60.13	1.18	217
3026	STORNOWAY, UNITED KINGDOM	1	58.22	6.32	181
3170	SHANWELL, UNITED KINGDOM	1	56.43	2.87	181
3322	AUGHTON, UNITED KINGDOM	0	53.55	2.92	181
3496	HEMSBY, UNITED KINGDOM	1	52.68	-1.68	216
3502	ABERPORTH, UNITED KINGDOM	1	52.13	4.57	181
3693	SHOEBURYNESS, UNITED KINGDOM	0	51.55	-.83	216
3743	LARKHILL, UNITED KINGDOM	0	51.20	1.80	181
3774	CRAWLEY, UNITED KINGDOM	1	51.08	.22	181
3808	CAMBORNE, UNITED KINGDOM	1	50.22	5.32	181
3920	LONG KESH, UNITED KINGDOM	1	54.48	6.10	181
3953	VALENTIA OBSERVATORY, IRELAND	1	51.93	10.25	182
4018	KEFLAVIK (2ND STATION), ICELAND	1	63.97	22.60	219
4202	THULE A.B., GREENLAND	1	76.52	68.83	259
4220	EGEDESMINDE, GREENLAND	1	68.70	52.75	222
4270	NARSSARSSUAQ, GREENLAND	1	61.18	45.43	221
4310	NORD, GREENLAND	1	81.60	16.70	902
4320	DANMARKSHAVN, GREENLAND	1	76.77	18.77	254
4340	KAP TOBIN, GREENLAND	1	70.42	21.97	255
4360	ANGMAGSSALIK, GREENLAND	1	65.60	37.63	220
6011	THORSHAVN, DENMARK	1	62.02	6.77	217
6030	ALBORG, DENMARK	0	57.10	-9.87	216
6181	KOBENHAVEN/GARDERHOJ, DENMARK	1	55.77	-12.52	215
6260	DE BILT, NETHERLANDS	0	52.10	-5.18	216
6447	UCCLE, BELGIUM	0	50.80	-4.35	216
6476	ST. HUBERT, BELGIUM	0	50.03	-5.40	216
6610	PAYERNE (ST.AEROL.), SWITZERLAND	0	46.82	-6.95	180
7110	BREST/GUIPAVAS, FRANCE	1	48.45	4.42	145
7145	TRAPPES, FRANCE	0	48.77	-2.02	180
7180	NANCY/ESSEY, FRANCE	0	48.68	-6.22	180
7480	LYON/BRON, FRANCE	0	45.72	-4.95	180
7510	BORDEAUX/MERIGNAC, FRANCE	0	44.83	.70	145
7645	NIMES/COUBESSAC, FRANCE	0	43.87	-4.40	180
7761	AJACCIO/CAMPO DEL ORO, FRANCE	1	41.92	-8.80	180
8001	LA CORUNA, SPAIN	1	43.37	8.42	145
8221	MADRID/BARAJAS, SPAIN	0	40.47	3.57	145
8302	PALMA/SON BONET, BALEARIC ISLANDS	1	39.60	-2.70	144
8495	NORTH FRONT, GIBRALTAR	1	36.15	5.33	109
8509	LAJES (ACORES), PORTUGAL	1	38.73	27.08	111
8521	FUNCHAL (MADEIRA), PORTUGAL	1	32.68	16.77	110
8536	LISBOA/PORTELA, PORTUGAL	1	38.77	9.13	109
8594	SAL (CABO VERDE), PORTUGAL	1	16.73	22.95	39
4YA	FIXED SHIP, NORTH ATLANTIC OCEAN	1	61.80	29.20	219
4YB	FIXED SHIP, NORTH ATLANTIC OCEAN	1	56.50	51.00	186
4YC	FIXED SHIP, NORTH ATLANTIC OCEAN	1	52.70	35.50	184
4YD	FIXED SHIP, NORTH ATLANTIC OCEAN	1	44.00	41.00	149
4YE	FIXED SHIP, NORTH ATLANTIC OCEAN	1	35.00	48.00	113
4YH	FIXED SHIP, ATLANTIC OCEAN	1	38.00	71.00	116
4YI	FIXED SHIP, NORTH ATLANTIC OCEAN	1	57.90	15.80	182
4YJ	FIXED SHIP, NORTH ATLANTIC OCEAN	1	52.30	20.20	183
4YK	FIXED SHIP, NORTH ATLANTIC OCEAN	1	45.00	16.00	146

WMO number	Station name and country	Land/coast	Latitude	Longitude	Marsden square
4YM	FIXED SHIP, NORWEGIAN SEA	1	65.70	-2.20	252
4YN	FIXED SHIP, NORTH PACIFIC OCEAN	1	30.00	140.00	123
4YP	FIXED SHIP, NORTH PACIFIC OCEAN	1	50.00	145.00	195
4YT	FIXED SHIP, PHILIPPINE SEA	1	28.80	-134.70	95
4YV	FIXED SHIP, NORTH PACIFIC OCEAN	1	34.00	-164.00	128

APPENDIX C

4YNFIXED SHIP, NORTH PACIFIC OCEAN						1	1	3000	14000	12
1467	267	0	1	73	2		27	236	79	227
82	256	86	224	79	265		88	238	80	156
54	215	71	206	71	190		64	215	73	203
68	2631	75	116	78	115		83	129	86	117
82	132	89	118	80	75		53	107	70	106
72	95	63	108	72	106		69	1324	75	120
81	112	80	127	85	107		76	133	88	120
80	81	54	108	72	100		70	95	66	107
74	97	66	1307	75	184		78	171	75	220
86	192	86	246	93	180		76	134	86	159
74	141	68	151	79	145		67	151	74	2074
79	90	78	84	73	110		85	100	85	124
94	95	81	64	85	86		80	72	68	78
82	75	69	79	75	1057		80	94	78	87
78	110	87	92	86	122		92	85	71	70
86	73	68	69	69	73		77	70	65	72
74	1017	78	232	98	217		96	251	98	221
99	263	99	234	99	154		99	212	99	200
97	187	98	214	100	202		100	2587	98	114
98	108	94	127	98	116		99	131	99	115
97	74	99	106	99	103		97	93	98	108
100	106	100	1301	98	118		98	109	97	124
98	105	98	132	99	119		99	80	99	106
98	97	97	94	99	106		99	96	99	1286
98	62	39	51	35	56		42	24	48	35
11	60	55	518	124	92		124	96	125	90
66	83	58	58	112	114		1142	9	9	9
8	10	10	10	7	10		9	10	9	9
6	6	5	5	6	6		7	6	6	6
5	5	6	1017	1018	1022		1025	1023	1023	1022
1020	1019	1019	1020	1020	1021		1018	1018	1023	1025
1023	1024	1022	1020	1019	1020		1021	1020	1022	1019
1019	1023	1025	1024	1024	1022		1021	1019	1020	1021
1021	1022	182	170	166	168		182	198	205	222
228	222	200	188	192	185		172	168	170	183
198	205	222	230	222	202		190	192	185	172
168	170	185	198	205	222		230	225	202	192
192	142	120	118	116	138		155	162	175	185
172	142	138	148	142	122		120	118	138	156
165	178	188	172	142	142		148	145	125	122
122	140	158	165	182	188		175	145	145	148
342	336	336	335	341	348		350	355	358	352
340	342	344	343	337	337		336	341	348	351
356	359	353	341	343	345		344	337	337	337
342	350	351	357	359	353		342	344	345	71
62	61	61	69	76	80		86	91	83	70

Raw radiosonde observation data as it appears GTE Sylvania Long A tape.
Station 4YN Fixed ship, North Pacific Ocean (Record one)

69	73	72	63	62	62	69	78	81	88
92	84	71	71	73	72	64	63	62	70
78	81	89	93	85	72	72	74	343	337
337	333	342	349	351	356	359	353	341	343
345	344	338	338	337	342	349	352	357	360
354	342	344	346	345	338	338	338	343	351
352	358	360	354	343	345	346	-72	-75	-64
-89	-60	-59	-62	-88	-72	-69	-73	-56	-67
-71	-67	-64	-85	-59	-59	-62	-84	-71	-67
-72	-56	-66	-53	-52	-48	-53	-51	-50	-56
-63	-60	-59	-58	-53	-54	-49	-47	-44	-45
-47	-51	-51	-58	-54	-52	-48	-49	-49	120
140	70	60	70	50	50	60	30	110	290
80	60	157	209	180	77	93	63	68	69
50	133	22	121	87	210	230	220	100	140
100	80	100	100	170	60	180	170	110	240
240	20	350	10	40	70	20	80	290	120
40	206	279	281	71	68	52	66	130	95
134	30	174	115	240	330	360	130	150	110
140	210	160	210	80	250	210	19	19	19
17	14	12	12	13	11	12	16	16	16
21	19	19	17	14	12	14	14	12	14
17	16	16	21	20	20	18	15	12	14
15	14	15	18	17	16	17	18	14	11
10	10	8	9	8	10	12	12	12	18
19	15	12	11	10	9	10	9	11	12
13	12	19	19	16	12	11	10	10	10
10	12	13	14	12	129	108	130	133	159
168	105	145	145	128	137	120	1607	0	1
0	0	1	1	1	0	2	0	2	0
8	22	26	28	37	16	10	11	28	19
19	11	7	234	242	1482	651	1851		

Raw radiosonde observation data as it appears GTE Sylvania Long A tape.
Station 4YN Fixed ship, North Pacific Ocean (Record one continued)

4YNFIXED SHIP, NORTH PACIFIC OCEAN						1 2	53	52	55
64	59	62	58	64	64	65	62	55	61
55	54	57	66	61	64	61	66	67	67
65	57	62	57	57	60	68	63	67	64
68	69	70	67	60	62	53	53	49	61
56	63	57	62	63	60	61	44	57	57
55	66	72	65	66	64	70	71	75	68
71	67	47	43	46	56	55	60	57	58
59	58	58	52	56	49	45	48	58	57
63	60	61	61	61	61	55	56	52	47
51	60	60	65	63	63	64	64	63	57
57	42	37	36	46	48	60	56	51	52
47	55	40	47	56	53	61	71	66	65
64	70	71	75	67	71	66	0	0	0
0	0	0	0	0	1	0	1	0	0
0	1	0	0	0	1	1	0	1	0
1	0	0	1	2	1	1	1	2	2
1	3	1	3	1	1	0	1	0	0
1	0	2	0	3	0	3	0	1	0
0	0	0	0	1	0	0	0	0	0
0	0	10	13	11	17	5	4	6	15
11	11	6	3	11	12	15	13	19	7
6	8	18	13	13	8	5	11	14	17
15	22	8	7	10	20	16	15	10	6
12	19	27	18	29	11	9	16	30	25
22	12	9	19	5	3	7	9	2	1
1	3	1	3	3	0	3	466	264	234
134	264	714	705	512	874	632	279	443	445
339	264	195	848	226	294	641	791	388	368
186	99	376	7946	-176	-174	-173	1384	1452	663
1498	1549	639	1571	1646	625	186	194	107	8
11	10	175	747	1530	226	279	156	94	109
56	3	7	10	712	1593	1965	185	227	135
117	133	125	5	10	14	458	1255	1868	151
207	185	1273	1286	1369	1428	1522	1571	1534	1561
1577	1530	1552	1560	1491	1522	1539	1152	1185	1200
1490	1515	1535	1519	1551	1566	1564	1572	1581	1534
1544	1568	1517	1542	1557	1373	1401	1433	1488	1498
1508	166	180	192	164	173	189	158	172	181
151	172	175	159	168	175	198	203	210	177
210	227	211	220	237	166	171	185	172	181
189	211	215	236	170	177	200	183	186	189
7	7	8	6	7	8	6	8	9	7
8	8	6	7	8	8	8	9	8	10
12	8	10	12	5	6	7	5	5	6
10	12	13	6	7	8	8	8	8	-72
-67	-58	-83	-69	-63	-72	-65	-58	-82	-74

Raw radiosonde observation data as it appears GTE Sylvania Long A tape.
Station 4YN Fixed ship, North Pacific Ocean (Record two)

-68	-80	-76	-65	-73	-69	-65	-105	-95	-68
-85	-81	-70	-55	-53	-44	-50	-45	-42	-95
-92	-85	-70	-67	-61	-72	-69	-67	119	120
121	118	119	122	117	118	119	121	122	123
114	116	116	112	114	115	117	118	119	116
117	117	114	115	116	112	114	116	119	119
120	113	115	116	117	117	117	117	118	119
121	122	124	119	119	120	118	119	119	116
116	116	115	115	116	111	111	112	111	112
114	116	117	120	112	114	114	120	121	124
120	120	121	117	117	117	117	117	118	122
122	124	118	120	120	117	118	119	115	116
117	115	116	116	111	112	112	111	111	113
116	117	119	113	113	114	121	121	124	120
121	122	117	117	117	0	0	0	0	196
0	0	0	0	0	0	0	0	214	0
0	492	0	0	205	0	0	0	0	175
209	243	0	0	0	171	193	216	0	0
0	196	210	216	0	0	0	0	47	0
0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	1	1
1	0	0	0	2	3	4	0	0	0
1	2	4	76	89	103	84	86	92	83
88	93	83	83	84	110	127	144	51	76
85	94	137	179	103	129	155	104	129	156
104	121	146	76	112	121	51	58	75	92
93	94	3	4	6	2	3	3	4	5
7	4	7	9	3	4	4	1	2	12
1	3	5	2	3	4	1	2	4	1
2	3	2	3	6	1	1	1	3	3
	583	832	663	547	545	464	397	546	499
693	630	1517	704	730	990	746	577	583	1194
680	815	1006	1014	760	3483	764	927	1249	876
694	603	2732	1648	1255	1463	1470	1006	4104	799
0	0	0	0	0	0	0	0	487	0
213	0	213	0	74	0	0	479	34	620
0	583	0	357	0	483	0	0	0	0
0	0	0	0	680	0	501	0	501	176
173	184	185	180	134	111	102	194	198	103
180	171	206	186	201	205	197	151	133	119
212	216	121	194	175	220	224	223	217	216
166	148	155	251	242	129	221	182		

Raw radiosonde observation data as it appears GTE Sylvania Long A tape.
Station 4YN Fixed ship, North Pacific Ocean (Record two continued)

APPENDIX D

MSQ = 85 M SUB SQ = 54 PAULUS DISTRIBUTION P.O.R. = 7001-8412 630000
# REC = 60605# REC VALID = 50598# QC FAIL = 9800# TIME FAIL = 207 630001

85	1	1	1	1	71	2	42	3	118	4	172	5	251	6	331	630002
85	1	1	1	7	378	8	313	9	262	10	163	11	100	12	43	630003
85	1	1	1	13	18	14	10	15	5	16	1	17	0	18	0	630004
85	1	1	1	19	0	20	0	21	0	22	0					630005
85	1	1	1	23	12.7	24	9.3	25	12.8	26	16.2	27	2278			630006
85	1	2	1	1	40	2	53	3	113	4	231	5	285	6	322	630007
85	1	2	1	7	290	8	247	9	135	10	92	11	38	12	15	630008
85	1	2	1	13	7	14	3	15	0	16	0	17	0	18	0	630009
85	1	2	1	19	0	20	0	21	1	22	0					630010
85	1	2	1	23	11.4	24	8.2	25	11.3	26	14.6	27	1872			630011
85	2	1	1	1	53	2	40	3	101	4	168	5	271	6	346	630012
85	2	1	1	7	357	8	298	9	230	10	154	11	100	12	56	630013
85	2	1	1	13	23	14	12	15	4	16	4	17	0	18	1	630014
85	2	1	1	19	0	20	0	21	0	22	0					630015
85	2	1	1	23	12.9	24	9.4	25	12.7	26	16.3	27	2218			630016
85	2	2	1	1	33	2	62	3	108	4	206	5	304	6	298	630017
85	2	2	1	7	254	8	226	9	124	10	75	11	36	12	13	630018
85	2	2	1	13	8	14	2	15	1	16	0	17	0	18	0	630019
85	2	2	1	19	0	20	0	21	0	22	0					630020
85	2	2	1	23	11.3	24	8.2	25	11.1	26	14.4	27	1750			630021
85	3	1	1	1	53	2	43	3	69	4	152	5	264	6	356	630022
85	3	1	1	7	416	8	330	9	304	10	186	11	124	12	54	630023
85	3	1	1	13	30	14	9	15	5	16	1	17	0	18	1	630024
85	3	1	1	19	0	20	0	21	0	22	0					630025
85	3	1	1	23	13.3	24	10.1	25	13.3	26	16.8	27	2397			630026
85	3	2	1	1	21	2	49	3	119	4	206	5	291	6	334	630027
85	3	2	1	7	318	8	252	9	171	10	87	11	34	12	11	630028
85	3	2	1	13	9	14	1	15	1	16	0	17	2	18	0	630029
85	3	2	1	19	0	20	0	21	0	22	0					630030
85	3	2	1	23	11.7	24	8.6	25	11.6	26	14.7	27	1906			630031
85	4	1	1	1	44	2	21	3	69	4	121	5	245	6	326	630032
85	4	1	1	7	404	8	385	9	378	10	272	11	165	12	75	630033
85	4	1	1	13	23	14	14	15	7	16	5	17	1	18	0	630034
85	4	1	1	19	0	20	0	21	0	22	0					630035
85	4	1	1	23	14.2	24	10.9	25	14.2	26	17.6	27	2555			630036
85	4	2	1	1	18	2	49	3	91	4	180	5	278	6	348	630037
85	4	2	1	7	362	8	292	9	200	10	96	11	37	12	13	630038
85	4	2	1	13	3	14	3	15	0	16	0	17	0	18	0	630039
85	4	2	1	19	0	20	0	21	0	22	0					630040
85	4	2	1	23	12.0	24	9.1	25	12.1	26	15.0	27	1970			630041
85	5	1	1	1	57	2	36	3	66	4	146	5	252	6	436	630042
85	5	1	1	7	453	8	391	9	287	10	183	11	101	12	41	630043
85	5	1	1	13	16	14	6	15	4	16	2	17	1	18	0	630044
85	5	1	1	19	2	20	0	21	0	22	0					630045
85	5	1	1	23	13.1	24	10.3	25	13.1	26	16.2	27	2480			630046

Raw surface data as it appears on the DUCT63 tape. Marsden square 85.

85	5	2	1	1	21	2	51	3	100	4	222	5	348	6	460	630047
85	5	2	1	7	341	8	235	9	126	10	69	11	19	12	7	630048
85	5	2	1	13	4	14	1	15	0	16	0	17	0	18	0	630049
85	5	2	1	19	0	20	0	21	0	22	0					630050
85	5	2	1	23	11.3	24	8.6	25	11.1	26	13.8	27	2004			630051
85	6	1	1	1	68	2	64	3	119	4	183	5	273	6	404	630052
85	6	1	1	7	456	8	328	9	268	10	133	11	61	12	29	630053
85	6	1	1	13	9	14	6	15	3	16	0	17	0	18	0	630054
85	6	1	1	19	0	20	1	21	0	22	0					630055
85	6	1	1	23	12.2	24	9.2	25	12.4	26	15.4	27	2405			630056
85	6	2	1	1	25	2	62	3	141	4	245	5	372	6	426	630057
85	6	2	1	7	324	8	201	9	73	10	36	11	17	12	4	630058
85	6	2	1	13	1	14	0	15	0	16	0	17	0	18	0	630059
85	6	2	1	19	0	20	0	21	0	22	0					630060
85	6	2	1	23	10.5	24	8.0	25	10.6	26	13.1	27	1927			630061
85	7	1	1	1	76	2	45	3	131	4	178	5	292	6	452	630062
85	7	1	1	7	434	8	347	9	200	10	104	11	56	12	26	630063
85	7	1	1	13	8	14	3	15	2	16	1	17	0	18	0	630064
85	7	1	1	19	0	20	0	21	0	22	0					630065
85	7	1	1	23	11.9	24	9.1	25	12.0	26	14.9	27	2355			630066
85	7	2	1	1	40	2	96	3	124	4	283	5	407	6	404	630067
85	7	2	1	7	318	8	144	9	77	10	27	11	11	12	5	630068
85	7	2	1	13	3	14	0	15	0	16	0	17	0	18	0	630069
85	7	2	1	19	0	20	0	21	0	22	0					630070
85	7	2	1	23	10.1	24	7.6	25	10.1	26	12.6	27	1939			630071
85	8	1	1	1	78	2	42	3	85	4	158	5	236	6	336	630072
85	8	1	1	7	386	8	363	9	249	10	123	11	79	12	35	630073
85	8	1	1	13	13	14	3	15	3	16	0	17	0	18	1	630074
85	8	1	1	19	0	20	0	21	0	22	0					630075
85	8	1	1	23	12.6	24	9.6	25	12.8	26	15.8	27	2190			630076
85	8	2	1	1	42	2	60	3	112	4	211	5	343	6	331	630077
85	8	2	1	7	327	8	198	9	92	10	45	11	18	12	4	630078
85	8	2	1	13	3	14	2	15	0	16	0	17	1	18	0	630079
85	8	2	1	19	0	20	0	21	0	22	0					630080
85	8	2	1	23	10.7	24	8.1	25	10.8	26	13.5	27	1789			630081
85	9	1	1	1	40	2	26	3	75	4	118	5	204	6	276	630082
85	9	1	1	7	352	8	341	9	267	10	161	11	98	12	65	630083
85	9	1	1	13	29	14	10	15	6	16	2	17	3	18	1	630084
85	9	1	1	19	0	20	0	21	0	22	0					630085
85	9	1	1	23	13.7	24	10.4	25	13.7	26	16.9	27	2074			630086
85	9	2	1	1	20	2	55	3	122	4	148	5	265	6	324	630087
85	9	2	1	7	245	8	211	9	139	10	62	11	39	12	13	630088
85	9	2	1	13	1	14	9	15	0	16	0	17	0	18	0	630089
85	9	2	1	19	0	20	0	21	0	22	0					630090
85	9	2	1	23	11.5	24	8.5	25	11.3	26	14.6	27	1653			630091
8510		1	1	1	56	2	19	3	51	4	137	5	225	6	321	630092

Raw surface data as it appears on the DUCT63 tape. Marsden square 85.

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8510 1 1  7    405  8    413  9    309 10    260 11    181 12     76    630093
8510 1 1 13     36 14     25 15     11 16      2 17      3 18      1    630094
8510 1 1 19      1 20      2 21      0 22      0                       630095
8510 1 1 23   14.3 24   10.9 25   14.3 26   17.8 27   2534            630096
8510 2 1  1     20  2     34  3     97  4    209  5    252  6    336    630097
8510 2 1  7    350  8    305  9    203 10     92 11     55 12     31    630098
8510 2 1 13      7 14      5 15      1 16      1 17      0 18      0    630099
8510 2 1 19      0 20      0 21      0 22      0                       630100
8510 2 1 23   12.3 24    9.1 25   12.3 26   15.3 27   1998            630101
8511 1 1  1     42  2     29  3     75  4    103  5    194  6    302    630102
8511 1 1  7    368  8    386  9    299 10    260 11    167 12     92    630103
8511 1 1 13     31 14     24 15     13 16      5 17      0 18      1    630104
8511 1 1 19      0 20      0 21      0 22      0                       630105
8511 1 1 23   14.4 24   11.0 25   14.4 26   18.0 27   2391            630106
8511 2 1  1     11  2     42  3     91  4    155  5    220  6    333    630107
8511 2 1  7    333  8    302  9    208 10    110 11     45 12     31    630108
8511 2 1 13     10 14      5 15      1 16      1 17      1 18      0    630109
8511 2 1 19      0 20      0 21      0 22      0                       630110
8511 2 1 23   12.6 24    9.6 25   12.6 26   15.6 27   1899            630111
8512 1 1  1     40  2     35  3     76  4    156  5    232  6    307    630112
8512 1 1  7    337  8    326  9    271 10    199 11    126 12     76    630113
8512 1 1 13     39 14     18 15      2 16      2 17      2 18      0    630114
8512 1 1 19      0 20      0 21      0 22      0                       630115
8512 1 1 23   13.7 24   10.1 25   13.6 26   17.3 27   2244            630116
8512 2 1  1     22  2     39  3     79  4    150  5    274  6    305    630117
8512 2 1  7    293  8    232  9    163 10    116 11     59 12     23    630118
8512 2 1 13      9 14      3 15      1 16      1 17      0 18      0    630119
8512 2 1 19      0 20      0 21      1 22      0                       630120
8512 2 1 23   12.3 24    9.1 25   12.1 26   15.4 27   1770            630121
85 1 1D12  678    0    0    0    0    0    0    0    0    0    0    0  630122
85 1 1D12    0    0    0    0    0    0    0    0    0    0     .0 28121 630123
85 2 1D12   11  363    6    4    0    1    3    4    4    5    5    0  630124
85 2 1D12    3    1    2    1    2    1    1    3   22    0     .0 28121 630125
85 3 1D12   49   14  653   63   12    8    6    3    8    3    7    3  630126
85 3 1D12    4    5    4    3    1    4    3    6  176    0     .0 28121 630127
85 4 1D12   60   18   26 1156   94   39   26   17   18   16   15   13  630128
85 4 1D12    3    8   10    3    3    4    7   13  243    0     .0 28121 630129
85 5 1D12   52   17   22   39 1715  229   96   55   59   37   23   14  630130
85 5 1D12   21   14   10    9   15   11    9   12  480    0     .0 28121 630131
85 6 1D12   28   13   31   24   40 2366  407  150  102   88   51   38  630132
85 6 1D12   32   25   15   10   14    9   15    5  730    0     .0 28121 630133
85 7 1D12   32   14   13   21   25   40 2735  423  166  116   91   65  630134
85 7 1D12   47   33   32   38   17   27   15   16  780    0     .0 28121 630135
85 8 1D12    5    6    6   12    6   17   29 2131  450  207  144  100  630136
85 8 1D12   72   63   73   43   26   23   28   19  761    0     .0 28121 630137
85 9 1D12   11    2    1    0    4    2   12   14 1547  370  204  131  630138
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Raw surface data as it appears on the DUCT63 tape. Marsden square 85.

85 9	1D12	93	68	63	53	28	24	23	22	652	0	.0	28121	630139
8510	1D12	2	1	0	3	4	1	3	4	6	1054	214	117	630140
8510	1D12	97	68	47	40	27	20	27	21	442	0	.0	28121	630141
8511	1D12	0	0	0	1	0	0	1	0	2	2	618	114	630142
8511	1D12	71	66	34	23	19	26	18	13	350	0	.0	28121	630143
8512	1D12	0	0	1	0	0	0	0	0	0	0	1	281	630144
8512	1D12	51	29	26	23	23	12	9	6	206	0	.0	28121	630145
8513	1D12	0	0	0	0	0	0	0	0	0	2	0	0	630146
8513	1D12	106	21	9	8	4	8	5	2	110	0	.0	28121	630147
8514	1D12	0	0	0	0	0	0	0	0	0	0	0	0	630148
8514	1D12	0	67	9	3	9	2	2	9	39	0	.0	28121	630149
8515	1D12	0	0	0	0	0	0	0	0	0	0	0	0	630150
8515	1D12	0	0	17	1	1	2	1	2	41	0	.0	28121	630151
8516	1D12	0	0	0	0	0	0	0	0	0	0	0	0	630152
8516	1D12	0	0	0	8	1	0	2	0	14	0	.0	28121	630153
8517	1D12	0	0	0	0	0	0	0	0	0	0	0	0	630154
8517	1D12	0	0	0	0	2	0	1	0	7	0	.0	28121	630155
8518	1D12	0	0	0	0	0	0	0	0	0	0	0	0	630156
8518	1D12	0	0	0	0	0	1	0	0	5	0	.0	28121	630157
8519	1D12	0	0	0	0	0	0	0	0	0	0	0	0	630158
8519	1D12	0	0	0	0	0	0	0	1	2	0	.0	28121	630159
8520	1D12	0	0	0	0	0	0	0	0	0	0	0	0	630160
8520	1D12	0	0	0	0	0	0	0	0	3	0	.0	28121	630161
8521	1D12	0	0	0	0	0	0	0	0	0	0	0	0	630162
8521	1D12	0	0	0	0	0	0	0	0	0	0	.0	28121	630163
8522	1D12	0	0	0	0	0	0	0	0	0	0	0	0	630164
8522	1D12	0	0	0	0	0	0	0	0	0	0	.0	28121	630165
85 1	2D12	307	2	2	0	0	0	1	0	1	0	0	0	630166
85 1	2D12	0	0	0	0	0	0	0	0	0	0	.0	22477	630167
85 2	2D12	5	543	22	13	3	5	8	1	1	1	0	1	630168
85 2	2D12	4	1	3	3	2	2	2	1	31	0	.0	22477	630169
85 3	2D12	20	4	1032	92	14	10	5	6	8	4	9	5	630170
85 3	2D12	3	8	6	0	0	1	1	1	68	0	.0	22477	630171
85 4	2D12	12	4	9	2058	132	34	34	13	9	12	3	3	630172
85 4	2D12	7	4	1	5	2	1	0	9	94	0	.0	22477	630173
85 5	2D12	8	2	11	13	3019	205	86	43	30	21	18	10	630174
85 5	2D12	12	8	4	6	5	0	3	3	132	0	.0	22477	630175
85 6	2D12	5	3	3	4	16	3477	300	97	47	60	28	22	630176
85 6	2D12	17	6	4	2	3	0	4	4	119	0	.0	22477	630177
85 7	2D12	3	0	0	1	4	6	3144	208	96	56	39	19	630178
85 7	2D12	8	10	8	9	7	2	4	2	129	0	.0	22477	630179
85 8	2D12	1	0	1	1	1	0	1	2311	205	105	38	22	630180
85 8	2D12	26	15	11	8	4	4	7	0	84	0	.0	22477	630181
85 9	2D12	0	0	1	0	0	0	1	1	1343	137	67	27	630182
85 9	2D12	34	18	10	7	7	2	2	0	54	0	.0	22477	630183
8510	2D12	0	0	0	0	0	0	0	0	0	737	60	30	630184

Raw surface data as it appears on the DUCT63 tape. Marsden square 85.

8510	2D12	19	10	4	8	4	3	0	2	30	0	.0	22477	630185
8511	2D12	0	0	0	0	0	0	0	0	0	0	303	32	630186
8511	2D12	14	14	8	3	1	5	2	2	24	0	.0	22477	630187
8512	2D12	0	0	0	0	0	0	0	0	0	0	0	127	630188
8512	2D12	11	4	10	5	1	2	0	0	10	0	.0	22477	630189
8513	2D12	0	0	0	0	0	0	0	0	0	0	0	0	630190
8513	2D12	49	1	4	1	2	1	1	0	6	0	.0	22477	630191
8514	2D12	0	0	0	0	0	0	0	0	0	0	0	0	630192
8514	2D12	0	24	1	1	2	1	1	0	4	0	.0	22477	630193
8515	2D12	0	0	0	0	0	0	0	0	0	0	0	0	630194
8515	2D12	0	0	3	1	0	0	0	0	1	0	.0	22477	630195
8516	2D12	0	0	0	0	0	0	0	0	0	0	0	0	630196
8516	2D12	0	0	0	3	0	0	0	0	0	0	.0	22477	630197
8517	2D12	0	0	0	0	0	0	0	0	0	0	0	0	630198
8517	2D12	0	0	0	0	2	1	0	0	1	0	.0	22477	630199
8518	2D12	0	0	0	0	0	0	0	0	0	0	0	0	630200
8518	2D12	0	0	0	0	0	0	0	0	0	0	.0	22477	630201
8519	2D12	0	0	0	0	0	0	0	0	0	0	0	0	630202
8519	2D12	0	0	0	0	0	0	0	0	0	0	.0	22477	630203
8520	2D12	0	0	0	0	0	0	0	0	0	0	0	0	630204
8520	2D12	0	0	0	0	0	0	0	0	0	0	.0	22477	630205
8521	2D12	0	0	0	0	0	0	0	0	0	0	0	0	630206
8521	2D12	0	0	0	0	0	0	0	0	2	0	.0	22477	630207
8522	2D12	0	0	0	0	0	0	0	0	0	0	0	0	630208
8522	2D12	0	0	0	0	0	0	0	0	0	0	.0	22477	630209
85	1 1 W	0	35	44	162	154	267	343	253	297	199	182	171	630210
85	1 1 W	51	63	17	13	12	3	3	2	1	6	6.8	2278	630211
85	1 2 W	0	43	61	135	134	204	269	232	218	175	145	132	630212
85	1 2 W	39	47	13	7	13	3	1	0	0	1	6.5	1872	630213
85	2 1 W	0	40	64	145	180	235	305	251	270	192	196	157	630214
85	2 1 W	68	50	27	9	13	7	0	5	0	4	6.7	2218	630215
85	2 2 W	0	48	40	137	129	222	221	218	218	147	131	117	630216
85	2 2 W	33	45	17	11	9	6	0	1	0	0	6.5	1750	630217
85	3 1 W	0	33	86	172	205	232	304	310	274	211	186	161	630218
85	3 1 W	67	86	23	17	16	7	0	2	1	4	6.7	2397	630219
85	3 2 W	0	48	57	147	133	220	271	213	246	158	120	126	630220
85	3 2 W	53	61	23	14	9	3	1	2	0	1	6.5	1906	630221
85	4 1 W	0	26	58	112	169	222	307	308	349	285	254	201	630222
85	4 1 W	92	89	23	25	16	9	0	9	1	0	7.2	2555	630223
85	4 2 W	0	37	44	128	121	183	289	235	278	184	152	154	630224
85	4 2 W	58	61	24	6	9	5	0	2	0	0	6.8	1970	630225
85	5 1 W	0	31	48	134	146	253	357	339	374	255	208	175	630226
85	5 1 W	74	60	11	4	5	3	0	0	0	3	6.8	2480	630227
85	5 2 W	0	44	45	107	152	220	305	262	294	176	149	140	630228
85	5 2 W	42	44	15	2	2	2	2	1	0	0	6.5	2004	630229
85	6 1 W	0	52	91	159	159	238	329	298	304	239	205	174	630230

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85	6	1	W	58	55	18	8	12	5	0	0	0	1	6.6	2405	630231
85	6	2	W	0	34	61	157	117	201	310	206	286	206	139	114	630232
85	6	2	W	42	40	6	4	0	0	0	2	0	2	6.4	1927	630233
85	7	1	W	0	44	55	144	174	246	331	315	334	237	191	129	630234
85	7	1	W	44	49	19	14	17	5	2	1	3	1	6.6	2355	630235
85	7	2	W	0	55	49	135	153	238	262	272	260	179	107	128	630236
85	7	2	W	49	26	8	4	9	3	2	0	0	0	6.3	1939	630237
85	8	1	W	0	40	54	142	162	291	360	316	271	185	158	123	630238
85	8	1	W	39	29	10	2	3	0	1	3	0	1	6.2	2190	630239
85	8	2	W	0	47	59	134	148	236	309	234	213	148	121	89	630240
85	8	2	W	19	25	6	0	0	0	0	0	0	1	5.9	1789	630241
85	9	1	W	0	42	82	178	179	268	263	280	271	192	125	106	630242
85	9	1	W	34	29	10	6	3	1	0	0	1	4	6.1	2074	630243
85	9	2	W	0	74	74	160	184	180	245	181	197	128	87	80	630244
85	9	2	W	25	17	10	6	1	0	1	0	1	2	5.7	1653	630245
85	10	1	W	0	38	76	169	237	365	388	365	351	209	122	108	630246
85	10	1	W	43	32	11	12	4	1	0	2	1	0	6.1	2534	630247
85	10	2	W	0	39	75	186	185	303	350	246	234	144	92	85	630248
85	10	2	W	23	16	14	0	4	1	0	0	0	1	5.7	1998	630249
85	11	1	W	0	37	71	149	194	250	338	314	303	237	192	154	630250
85	11	1	W	64	46	14	11	5	4	1	2	2	3	6.6	2391	630251
85	11	2	W	0	45	66	131	165	237	269	245	235	162	119	109	630252
85	11	2	W	58	32	14	2	6	1	0	2	0	1	6.2	1899	630253
85	12	1	W	0	12	68	134	173	223	285	280	269	193	194	169	630254
85	12	1	W	93	83	26	22	8	3	3	6	0	0	7.0	2244	630255
85	12	2	W	0	31	58	126	125	181	228	224	215	172	113	145	630256
85	12	2	W	54	49	20	12	6	3	0	5	2	1	6.7	1770	630257
85	1	1	A	0	0	2	8	155	600	731	468	231	58	20	5	630258
85	1	1	A	0	0	0	0	0	0	0	0	0	0	12.2	2278	630259
85	1	2	A	0	1	1	15	160	592	605	322	146	27	1	1	630260
85	1	2	A	1	0	0	0	0	0	0	0	0	0	11.7	1872	630261
85	2	1	A	0	0	0	13	136	648	758	447	149	52	12	2	630262
85	2	1	A	1	0	0	0	0	0	0	0	0	0	12.0	2218	630263
85	2	2	A	0	0	0	7	138	631	612	284	59	18	1	0	630264
85	2	2	A	0	0	0	0	0	0	0	0	0	0	11.4	1750	630265
85	3	1	A	0	0	4	9	218	770	873	356	126	34	3	2	630266
85	3	1	A	2	0	0	0	0	0	0	0	0	0	11.5	2397	630267
85	3	2	A	0	0	4	12	203	730	668	232	46	8	2	1	630268
85	3	2	A	0	0	0	0	0	0	0	0	0	0	11.1	1906	630269
85	4	1	A	0	0	3	16	232	965	891	315	92	31	10	0	630270
85	4	1	A	0	0	0	0	0	0	0	0	0	0	11.3	2555	630271
85	4	2	A	0	0	1	10	256	897	607	161	28	7	1	1	630272
85	4	2	A	1	0	0	0	0	0	0	0	0	0	10.7	1970	630273
85	5	1	A	0	0	3	6	101	805	1056	377	113	14	5	0	630274
85	5	1	A	0	0	0	0	0	0	0	0	0	0	11.7	2480	630275
85	5	2	A	0	0	0	6	133	790	830	213	26	5	1	0	630276

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85	5	2	A	0	0	0	0	0	0	0	0	0	0	11.2	2004	630277
85	6	1	A	0	0	0	3	21	379	1102	682	172	33	10	1	630278
85	6	1	A	2	0	0	0	0	0	0	0	0	0	12.6	2405	630279
85	6	2	A	0	0	0	0	33	419	997	397	61	15	4	1	630280
85	6	2	A	0	0	0	0	0	0	0	0	0	0	12.1	1927	630281
85	7	1	A	0	0	0	1	3	70	755	936	407	133	36	7	630282
85	7	1	A	6	0	1	0	0	0	0	0	0	0	13.9	2355	630283
85	7	2	A	0	0	0	0	0	76	805	740	228	68	13	5	630284
85	7	2	A	4	0	0	0	0	0	0	0	0	0	13.4	1939	630285
85	8	1	A	0	0	0	0	0	30	454	849	528	228	69	19	630286
85	8	1	A	8	5	0	0	0	0	0	0	0	0	14.7	2190	630287
85	8	2	A	0	0	0	1	1	43	486	749	348	111	35	11	630288
85	8	2	A	3	1	0	0	0	0	0	0	0	0	14.1	1789	630289
85	9	1	A	0	0	0	1	3	62	408	751	571	181	67	23	630290
85	9	1	A	6	1	0	0	0	0	0	0	0	0	14.6	2074	630291
85	9	2	A	0	0	1	0	3	74	425	683	353	86	22	6	630292
85	9	2	A	0	0	0	0	0	0	0	0	0	0	14.0	1653	630293
8510	1	A		0	0	0	0	11	195	707	845	545	156	51	17	630294
8510	1	A		5	2	0	0	0	0	0	0	0	0	14.0	2534	630295
8510	2	A		0	0	0	0	13	174	679	657	368	90	11	6	630296
8510	2	A		0	0	0	0	0	0	0	0	0	0	13.5	1998	630297
8511	1	A		0	2	1	3	47	352	809	716	317	102	31	5	630298
8511	1	A		6	0	0	0	0	0	0	0	0	0	13.1	2391	630299
8511	2	A		0	0	0	3	44	331	714	542	213	44	6	1	630300
8511	2	A		0	0	1	0	0	0	0	0	0	0	12.7	1899	630301
8512	1	A		0	0	3	3	95	459	857	540	213	50	19	3	630302
8512	1	A		1	1	0	0	0	0	0	0	0	0	12.4	2244	630303
8512	2	A		0	0	2	11	109	449	669	396	106	27	1	0	630304
8512	2	A		0	0	0	0	0	0	0	0	0	0	12.0	1770	630305
85	1	1	M	0	0	2	4	7	14	54	113	275	417	1218	90	630306
85	1	1	M	44	21	11	3	5	0	0	0	0	0	-1.4	2278	630307
85	1	2	M	0	0	2	2	3	29	87	227	365	470	588	64	630308
85	1	2	M	21	4	3	2	2	2	1	0	0	0	-1.9	1872	630309
85	2	1	M	1	0	0	1	8	6	26	81	226	419	1303	73	630310
85	2	1	M	36	18	12	5	2	0	0	0	0	1	-1.3	2218	630311
85	2	2	M	1	0	0	3	10	18	51	168	342	450	614	57	630312
85	2	2	M	23	10	2	0	0	1	0	0	0	0	-1.8	1750	630313
85	3	1	M	1	0	0	3	3	13	37	84	223	456	1442	54	630314
85	3	1	M	40	17	14	4	4	0	0	0	1	1	-1.3	2397	630315
85	3	2	M	0	0	1	4	5	25	66	189	351	519	665	50	630316
85	3	2	M	25	5	1	0	0	0	0	0	0	0	-1.9	1906	630317
85	4	1	M	0	0	0	2	7	13	28	88	231	469	1591	49	630318
85	4	1	M	38	17	10	4	3	3	1	1	0	0	-1.3	2555	630319
85	4	2	M	0	1	2	5	7	30	73	206	429	555	596	45	630320
85	4	2	M	16	3	2	0	0	0	0	0	0	0	-2.0	1970	630321
85	5	1	M	0	0	0	0	5	6	17	66	178	420	1640	62	630322

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85	5	1	M	41	17	15	7	3	1	1	1	0	0	-1.2	2480	630323
85	5	2	M	0	0	0	1	6	14	50	149	396	585	715	58	630324
85	5	2	M	22	5	3	0	0	0	0	0	0	0	-1.8	2004	630325
85	6	1	M	0	1	0	1	2	12	20	44	143	368	1557	120	630326
85	6	1	M	71	33	19	4	6	3	1	0	0	0	-1.0	2405	630327
85	6	2	M	0	0	0	1	2	15	35	115	335	512	803	82	630328
85	6	2	M	18	4	3	1	1	0	0	0	0	0	-1.6	1927	630329
85	7	1	M	0	0	1	1	6	8	16	30	119	315	1576	125	630330
85	7	1	M	91	38	19	4	2	3	1	0	0	0	-1.0	2355	630331
85	7	2	M	2	0	4	5	2	9	29	87	256	510	866	113	630332
85	7	2	M	40	13	1	1	0	1	0	0	0	0	-1.4	1939	630333
85	8	1	M	0	0	1	0	0	8	18	36	112	309	1493	102	630334
85	8	1	M	62	24	20	4	1	0	0	0	0	0	-1.0	2190	630335
85	8	2	M	0	0	1	2	5	9	38	99	286	456	778	77	630336
85	8	2	M	24	7	5	1	0	1	0	0	0	0	-1.5	1789	630337
85	9	1	M	0	0	0	0	2	5	16	61	126	276	1465	58	630338
85	9	1	M	33	17	9	3	2	1	0	0	0	0	-1.2	2074	630339
85	9	2	M	0	0	0	2	2	9	31	117	264	405	733	62	630340
85	9	2	M	22	5	1	0	0	0	0	0	0	0	-1.6	1653	630341
85	10	1	M	0	0	0	1	2	6	39	66	192	461	1636	58	630342
85	10	1	M	35	19	11	5	1	0	2	0	0	0	-1.3	2534	630343
85	10	2	M	0	0	1	2	3	22	57	150	372	535	783	47	630344
85	10	2	M	14	9	1	0	1	1	0	0	0	0	-1.8	1998	630345
85	11	1	M	0	1	0	3	4	14	30	86	254	507	1369	54	630346
85	11	1	M	31	22	9	4	3	0	0	0	0	0	-1.4	2391	630347
85	11	2	M	0	0	2	5	5	10	63	172	448	522	618	36	630348
85	11	2	M	7	6	1	4	0	0	0	0	0	0	-1.9	1899	630349
85	12	1	M	0	0	0	1	6	21	41	139	286	508	1105	77	630350
85	12	1	M	41	7	6	4	1	1	0	0	0	0	-1.5	2244	630351
85	12	2	M	0	0	2	2	8	31	88	195	375	499	499	43	630352
85	12	2	M	15	10	2	0	1	0	0	0	0	0	-2.1	1770	630353
85	1	1	r	2231	0	0	3	16	8	0	2	3	1	2	4	630354
85	1	1	r	4	1	0	0	1	0	0	1	0	1	3.5	2278	630355
85	1	2	r	1836	0	0	2	12	5	1	3	2	3	1	1	630356
85	1	2	r	1	1	0	0	0	1	0	1	0	2	3.6	1872	630357
85	2	1	r	2161	0	0	22	17	0	3	5	2	2	3	0	630358
85	2	1	r	0	0	0	1	0	0	1	1	0	0	3.1	2218	630359
85	2	2	r	1710	0	0	22	2	0	4	2	2	1	1	1	630360
85	2	2	r	0	1	1	0	0	1	2	0	0	0	3.2	1750	630361
85	3	1	r	2368	0	6	10	5	2	1	2	0	0	0	1	630362
85	3	1	r	1	0	0	0	1	0	0	0	0	0	1.2	2397	630363
85	3	2	r	1885	0	15	1	2	0	1	1	0	0	0	0	630364
85	3	2	r	0	1	0	0	0	0	0	0	0	0	.8	1906	630365
85	4	1	r	2520	0	3	25	1	2	1	1	2	0	0	0	630366
85	4	1	r	0	0	0	0	0	0	0	0	0	0	1.0	2555	630367
85	4	2	r	1942	0	8	14	0	1	1	4	0	0	0	0	630368

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85	4	2	r	0	0	0	0	0	0	0	0	0	0	1.0	1970	630369
85	5	1	r	2459	0	6	9	0	4	0	2	0	0	0	0	630370
85	5	1	r	0	0	0	0	0	0	0	0	0	0	.6	2480	630371
85	5	2	r	1978	0	19	0	1	2	1	2	0	0	0	0	630372
85	5	2	r	0	1	0	0	0	0	0	0	0	0	1.0	2004	630373
85	6	1	r	2388	0	1	5	1	3	2	0	1	0	1	0	630374
85	6	1	r	0	0	0	0	1	1	0	0	0	1	1.2	2405	630375
85	6	2	r	1915	0	4	4	1	1	1	0	0	0	0	0	630376
85	6	2	r	0	0	0	0	0	1	0	0	0	0	.6	1927	630377
85	7	1	r	2326	0	9	10	0	2	2	1	0	0	0	0	630378
85	7	1	r	1	0	1	0	0	1	1	0	0	1	1.6	2355	630379
85	7	2	r	1890	0	18	16	6	1	0	2	2	1	1	0	630380
85	7	2	r	1	0	0	0	0	0	0	0	0	1	2.2	1939	630381
85	8	1	r	2165	0	2	11	6	0	0	0	3	0	0	0	630382
85	8	1	r	1	0	0	1	0	1	0	0	0	0	1.3	2190	630383
85	8	2	r	1763	0	5	12	2	1	2	1	2	1	0	0	630384
85	8	2	r	0	0	0	0	0	0	0	0	0	0	1.3	1789	630385
85	9	1	r	2044	0	0	1	13	3	0	2	0	1	1	1	630386
85	9	1	r	2	2	0	1	1	0	0	1	0	1	2.9	2074	630387
85	9	2	r	1630	0	0	2	11	1	3	0	1	0	0	2	630388
85	9	2	r	0	1	0	0	0	0	0	0	0	2	2.3	1653	630389
8510	1	r	2500	0	0	4	19	1	0	2	0	1	1	2	630390	
8510	1	r	1	1	0	0	1	0	0	0	1	0	1.9	2534	630391	
8510	2	r	1964	0	0	4	25	0	0	1	0	0	0	2	630392	
8510	2	r	0	0	1	0	0	0	0	0	0	1	2.0	1998	630393	
8511	1	r	2341	0	0	4	23	4	3	5	2	0	0	5	630394	
8511	1	r	1	0	1	1	0	0	1	0	0	0	2.9	2391	630395	
8511	2	r	1872	0	0	2	6	0	2	4	1	1	3	1	630396	
8511	2	r	3	0	1	0	0	0	0	3	0	0	2.9	1[illegible]9	630397	
8512	1	r	2180	0	0	3	30	0	0	11	3	2	7	0	630398	
8512	1	r	1	1	1	0	0	0	1	0	0	4	4.9	2244	630399	
8512	2	r	1716	0	0	9	14	0	2	8	6	2	4	2	630400	
8512	2	r	3	0	1	0	0	0	1	0	0	2	5.2	1770	630401	
85	1	1	s	0	0	0	0	3	56	593	900	520	171	29	6	630402
85	1	1	s	0	0	0	0	0	0	0	0	0	0	166.7	2278	630403
85	1	2	s	0	0	1	0	1	55	560	773	377	95	7	2	630404
85	1	2	s	1	0	0	0	0	0	0	0	0	0	162.9	1872	630405
85	2	1	s	0	0	0	0	2	60	593	944	489	97	30	3	630406
85	2	1	s	0	0	0	0	0	0	0	0	0	0	164.4	2218	630407
85	2	2	s	0	0	0	0	1	38	583	774	304	46	4	0	630408
85	2	2	s	0	0	0	0	0	0	0	0	0	0	160.4	1750	630409
85	3	1	s	0	0	0	0	5	67	777	1076	374	82	11	4	630410
85	3	1	s	1	0	0	0	0	0	0	0	0	0	160.1	2397	630411
85	3	2	s	0	0	0	0	7	59	707	848	240	41	3	1	630412
85	3	2	s	0	0	0	0	0	0	0	0	0	0	157.0	1906	630413
85	4	1	s	0	0	0	0	5	91	957	1099	316	71	16	0	630414

Raw surface data as it appears on the DUCT63 tape. Marsden square 85.

85	4	1	s	0	0	0	0	0	0	0	0	0	157.4	2555	630415
85	4	2	s	0	0	0	0	1	99	862	799	178	27	2	2	630416
85	4	2	s	0	0	0	0	0	0	0	0	0	0	153.5	1970	630417
85	5	1	s	0	0	0	0	3	17	738	1275	380	56	11	0	630418
85	5	1	s	0	0	0	0	0	0	0	0	0	0	161.4	2480	630419
85	5	2	s	0	0	0	0	3	26	689	1048	217	19	2	0	630420
85	5	2	s	0	0	0	0	0	0	0	0	0	0	157.8	2004	630421
85	6	1	s	0	0	0	0	0	8	295	1309	665	107	18	2	630422
85	6	1	s	1	0	0	0	0	0	0	0	0	0	170.4	2405	630423
85	6	2	s	0	0	0	0	0	1	292	1160	420	45	5	1	630424
85	6	2	s	0	0	0	0	0	0	0	0	0	0	166.9	1927	630425
85	7	1	s	0	0	0	0	1	3	46	900	1021	299	68	12	630426
85	7	1	s	4	1	0	0	0	0	0	0	0	0	183.3	2355	630427
85	7	2	s	0	0	0	0	0	0	39	888	786	184	33	7	630428
85	7	2	s	2	0	0	0	0	0	0	0	0	0	180.0	1939	630429
85	8	1	s	0	0	0	0	0	0	18	584	1003	420	128	26	630430
85	8	1	s	9	2	0	0	0	0	0	0	0	0	190.5	2190	630431
85	8	2	s	0	0	0	0	0	2	30	565	841	274	60	14	630432
35	8	2	s	3	0	0	0	0	0	0	0	0	0	185.9	1789	630433
85	9	1	s	0	0	0	0	0	2	49	570	912	408	106	25	630434
85	9	1	s	2	0	0	0	0	0	0	0	0	0	189.1	2074	630435
85	9	2	s	0	0	0	0	1	2	56	507	773	264	42	8	630436
85	9	2	s	0	0	0	0	0	0	0	0	0	0	184.5	1653	630437
8510	1	1	s	0	0	0	0	0	4	164	921	947	390	82	22	630438
8510	1	1	s	3	1	0	0	0	0	0	0	0	0	182.5	2534	630439
8510	2	1	s	0	0	0	0	0	3	135	809	756	261	28	6	630440
8510	2	2	s	0	0	0	0	0	0	0	0	0	0	179.1	1998	630441
8511	1	1	s	0	0	0	2	2	15	325	991	766	216	63	8	630442
8511	1	1	s	3	0	0	0	0	0	0	0	0	0	174.6	2391	630443
8511	2	1	s	0	0	0	0	0	16	290	838	601	139	13	1	630444
8511	2	2	s	0	1	0	0	0	0	0	0	0	0	171.7	1899	630445
8512	1	1	s	0	0	0	1	2	34	438	1025	576	129	34	4	630446
8512	1	1	s	1	0	0	0	0	0	0	0	0	0	168.8	2244	630447
8512	2	1	s	0	0	0	0	3	35	430	795	414	85	8	0	630448
8512	2	2	s	0	0	0	0	0	0	0	0	0	0	165.1	1770	630449
85	1	1	t	0	0	56	1290	868	62	2	0	0	0	0	0	630450
85	1	1	t	0	0	0	0	0	0	0	0	0	0	74.0	2278	630451
85	1	2	t	0	1	46	1174	626	24	1	0	0	0	0	0	630452
85	1	2	t	0	0	0	0	0	0	0	0	0	0	72.0	1872	630453
85	2	1	t	0	0	49	1352	762	53	2	0	0	0	0	0	630454
85	2	1	t	0	0	0	0	0	0	0	0	0	0	72.8	2218	630455
85	2	2	t	0	0	34	1204	497	15	0	0	0	0	0	0	630456
85	2	2	t	0	0	0	0	0	0	0	0	0	0	70.6	1750	630457
85	3	1	t	0	1	53	1684	627	29	3	0	0	0	0	0	630458
85	3	1	t	0	0	0	0	0	0	0	0	0	0	70.5	2397	630459
85	3	2	t	0	0	54	1419	424	9	0	0	0	0	0	0	630460

Raw surface data as it appears on the DUCT63 tape. Marsden square 85.

85	3	2	t	0	0	0	0	0	0	0	0	0	0	68.8	1906	630461
85	4	1	t	0	0	85	1880	556	34	0	0	0	0	0	0	630462
85	4	1	t	0	0	0	0	0	0	0	0	0	0	69.0	2555	630463
85	4	2	t	0	0	86	1562	313	8	1	0	0	0	0	0	630464
85	4	2	t	0	0	0	0	0	0	0	0	0	0	66.9	1970	630465
85	5	1	t	0	0	18	1762	684	16	0	0	0	0	0	0	630466
85	5	1	t	0	0	0	0	0	0	0	0	0	0	71.2	2480	630467
85	5	2	t	0	0	24	1563	413	4	0	0	0	0	0	0	630468
85	5	2	t	0	0	0	0	0	0	0	0	0	0	69.2	2004	630469
85	6	1	t	0	0	5	1715	1153	29	3	0	0	0	0	0	630470
85	6	1	t	0	0	0	0	0	0	0	0	0	0	76.1	2405	630471
85	6	2	t	0	0	4	1174	732	17	0	0	0	0	0	0	630472
85	6	2	t	0	0	0	0	0	0	0	0	0	0	74.2	1927	630473
85	7	1	t	0	0	4	591	1617	135	7	1	0	0	0	0	630474
85	7	1	t	0	0	0	0	0	0	0	0	0	0	83.0	2355	630475
85	7	2	t	0	0	0	[illegible]	1290	74	5	0	0	0	0	0	630476
85	7	2	t	0	0	0	[illegible]	0	0	0	0	0	0	81.3	1939	630477
85	8	1	t	0	0	0	355	1570	245	20	0	0	0	0	0	630478
85	8	1	t	0	0	0	0	0	0	0	0	0	0	86.8	2190	630479
85	8	2	t	0	0	2	335	1318	129	5	0	0	0	0	0	630480
85	8	2	t	0	0	0	0	0	0	0	0	0	0	84.4	1789	630481
85	9	1	t	0	0	2	384	1478	201	9	0	0	0	0	0	630482
85	9	1	t	0	0	0	0	0	0	0	0	0	0	86.1	2074	630483
85	9	2	t	0	0	3	375	1179	96	0	0	0	0	0	0	630484
85	9	2	t	0	0	0	0	0	0	0	0	0	0	83.7	1653	630485
8510	1	1	t	0	0	2	797	1567	160	8	0	0	0	0	0	630486
8510	1	1	t	0	0	0	0	0	0	0	0	0	0	82.5	2534	630487
8510	2	1	t	0	0	2	704	1214	76	2	0	0	0	0	0	630488
8510	2	1	t	0	0	0	0	0	0	0	0	0	0	80.7	1998	630489
8511	1	1	t	0	2	13	1051	1211	107	7	0	0	0	0	0	630490
8511	1	1	t	0	0	0	0	0	0	0	0	0	0	78.3	2391	630491
8511	2	1	t	0	0	14	899	947	38	0	1	0	0	0	0	630492
8511	2	1	t	0	0	0	0	0	0	0	0	0	0	76.7	1899	630493
8512	1	1	t	0	1	26	1211	948	56	2	0	0	0	0	0	630494
8512	1	1	t	0	0	0	0	0	0	0	0	0	0	75.2	2244	630495
8512	2	1	t	0	0	31	1036	684	19	0	0	0	0	0	0	630496
8512	2	1	t	0	0	0	0	0	0	0	0	0	0	73.2	1770	630497
85	1	1	u	0	0	0	0	3	55	589	880	499	169	28	6	630498
85	1	1	u	0	1	0	6	3	6	3	3	3	22	176.3	2276	630499
85	1	2	u	0	0	0	0	1	55	558	748	365	94	7	3	630500
85	1	2	u	2	1	3	1	4	3	4	2	1	17	172.8	1869	630501
85	2	1	u	0	0	0	0	2	59	583	929	462	92	25	7	630502
85	2	1	u	1	5	8	9	7	4	2	2	0	18	172.7	2215	630503
85	2	2	u	0	0	0	0	1	38	577	756	290	42	4	0	630504
85	2	2	u	0	5	11	5	2	1	0	0	1	16	169.1	1749	630505
85	3	1	u	0	0	0	0	5	65	770	1065	369	74	14	8	630506

Raw surface data as it appears on the DUCT63 tape. Marsden square 85.

85	3	1	u	5	1	5	0	2	1	0	3	1	6	163.3	2394	630507
85	3	2	u	0	0	0	0	7	59	699	838	236	38	4	8	630508
85	3	2	u	5	2	1	0	0	0	2	0	0	4	159.3	1903	630509
85	4	1	u	0	0	0	0	5	90	949	1073	313	70	17	3	630510
85	4	1	u	8	14	2	1	1	0	1	1	0	4	160.0	2552	630511
85	4	2	u	0	0	0	0	1	98	854	785	168	27	3	7	630512
85	4	2	u	10	6	0	1	0	0	0	1	0	6	156.4	1967	630513
85	5	1	u	0	0	0	0	3	17	737	1261	371	57	11	1	630514
85	5	1	u	9	5	0	0	0	0	0	1	3	2	163.0	2478	630515
85	5	2	u	0	0	0	0	3	26	681	1033	208	22	2	8	630516
85	5	2	u	9	2	0	0	0	1	0	1	1	5	160.7	2002	630517
85	6	1	u	0	0	0	0	0	8	293	1304	657	104	17	2	630518
85	6	1	u	1	4	1	1	0	0	0	1	1	9	173.8	2403	630519
85	6	2	u	0	0	0	0	0	4	289	1153	417	43	6	3	630520
85	6	2	u	2	1	0	3	0	1	0	1	1	2	168.8	1926	630521
85	7	1	u	0	0	0	0	1	3	45	890	999	294	69	15	630522
85	7	1	u	9	6	3	3	0	1	1	0	0	9	187.7	2348	630523
85	7	2	u	0	0	0	0	0	0	38	876	768	163	29	19	630524
85	7	2	u	9	3	3	5	7	2	4	0	0	10	186.2	1936	630525
85	8	1	u	0	0	0	0	0	0	17	581	988	408	129	27	630526
85	8	1	u	11	2	3	5	2	5	1	1	0	6	194.1	2186	630527
85	8	2	u	0	0	0	0	0	2	30	562	824	264	61	12	630528
85	8	2	u	7	1	7	2	2	1	0	1	1	9	189.7	1786	630529
85	9	1	u	0	0	0	0	0	2	48	565	898	398	100	25	630530
85	9	1	u	2	0	0	2	3	4	1	3	4	15	197.3	2070	630531
85	9	2	u	0	0	0	0	1	2	55	503	762	253	41	8	630532
85	9	2	u	0	0	1	2	4	3	1	2	1	9	190.9	1648	630533
8510	1	u		0	0	0	0	0	4	163	911	935	378	79	21	630534
8510	1	u		3	1	0	6	6	4	4	1	3	11	187.7	2530	630535
8510	2	u		0	0	0	0	0	3	135	800	745	246	25	6	630536
8510	2	u		0	0	3	2	8	6	4	5	1	5	184.4	1994	630537
8511	1	u		0	0	0	2	2	15	324	971	746	207	60	8	630538
8511	1	u		3	0	2	7	6	7	3	3	0	22	182.6	2388	630539
8511	2	u		0	0	0	0	0	16	286	828	590	137	11	1	630540
8511	2	u		0	2	1	1	3	0	1	1	0	20	179.9	1898	630541
8512	1	u		0	0	0	1	2	34	432	1010	541	120	33	3	630542
8512	1	u		1	1	0	4	13	8	4	1	3	32	182.5	2243	630543
8512	2	u		0	0	0	0	3	35	425	784	388	71	7	0	630544
8512	2	u		1	2	3	5	5	6	1	0	0	30	178.2	1766	630545
85	1	1	v	0	0	56	1272	837	62	2	1	10	8	6	2	630546
85	1	1	v	2	4	1	3	4	3	0	1	0	2	78.3	2276	630547
85	1	2	v	0	0	46	1157	603	24	3	4	5	8	2	2	630548
85	1	2	v	2	2	3	1	2	1	0	0	0	4	76.2	1869	630549
85	2	1	v	0	0	48	1332	727	49	4	11	17	6	4	4	630550
85	2	1	v	1	5	1	3	0	0	1	0	0	2	76.8	2215	630551
85	2	2	v	0	0	34	1179	481	14	0	15	8	1	2	3	630552

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85	2	2	V	3	2	0	1	1	1	0	1		2	74.6	1749	630553
85	3	1	V	0	1	52	1667	611	32	10	6		2	4	1	630554
85	3	1	V	2	0	0	0	0	1	0	0		0	72.1	2394	630555
85	3	2	V	0	0	54	1405	413	10	11	4		2	0	1	630556
85	3	2	V	2	0	0	0	0	0	1	0		0	70.0	1903	630557
85	4	1	V	0	0	84	1858	540	35	11	15	3	1	1	3	630558
85	4	1	V	1	0	0	0	0	0	0	0	0	0	70.4	2552	630559
85	4	2	V	0	0	85	1540	303	9	14	8	1	0	1	3	630560
85	4	2	V	3	0	0	0	0	0	0	0	0	0	68.5	1967	630561
85	5	1	V	0	0	18	1749	674	16	8	7	0	0	4	1	630562
85	5	1	V	0	1	0	0	0	0	0	0	0	0	72.1	2478	630563
85	5	2	V	0	0	23	1540	406	6	17	2	0	1	2	2	630564
85	5	2	V	1	1	0	0	0	1	0	0	0	0	70.8	2002	630565
85	6	1	V	0	0	5	1208	1143	27	3	5	1	1	1	2	630566
85	6	1	V	1	2	0	1	0	0	0	0	0	3	77.6	2403	630567
85	6	2	V	0	0	4	1163	730	15	5	1	3	2	1	0	630568
85	6	2	V	1	0	0	0	0	0	0	0	0	1	75.2	1926	630569
85	7	1	V	0	0	4	586	1582	138	14	10	3	2	0	1	630570
85	7	1	V	2	0	1	0	0	1	0	1	1	2	85.0	2348	630571
85	7	2	V	0	0	0	566	1251	65	19	6	12	7	0	1	630572
85	7	2	V	1	2	3	1	0	1	0	0	0	1	84.4	1936	630573
85	8	1	V	0	0	0	353	1549	239	20	4	8	6	1	0	630574
85	8	1	V	0	2	1	0	0	1	0	1	1	0	88.5	2186	630575
85	8	2	V	0	0	2	334	1287	130	9	8	4	1	2	2	630576
85	8	2	V	4	1	2	0	0	0	0	0	0	0	86.4	1786	630577
85	9	1	V	0	0	2	379	1454	194	9	0	4	6	7	0	630578
85	9	1	V	2	2	1	2	2	2	1	0	0	3	89.5	2070	630579
85	9	2	V	0	0	3	372	1158	92	0	1	5	5	3	3	630580
85	9	2	V	0	1	0	0	2	0	1	0	0	2	86.4	1648	630581
8510	1		V	0	0	2	795	1530	160	8	0	12	8	3	2	630582
8510	1		V	2	0	1	1	2	1	1	0	0	2	84.9	2530	630583
8510	2		V	0	0	2	700	1185	71	2	2	8	13	6	0	630584
8510	2		V	1	0	0	1	1	0	1	0	0	1	83.3	1994	630585
8511	1		V	0	2	13	1038	1175	103	7	1	14	10	4	6	630586
8511	1		V	3	2	0	1	5	0	1	1	0	2	82.0	2388	630587
8511	2		V	0	0	14	887	933	35	0	3	4	1	2	2	630588
8511	2		V	3	2	3	1	1	1	3	0	0	3	80.2	1898	630589
8512	1		V	0	1	26	1200	898	51	1	1	16	12	3	5	630590
8512	1		V	9	4	2	4	2	1	2	0	0	5	81.2	2243	630591
8512	2		V	0	0	31	1021	645	16	1	5	9	8	0	2	630592
8512	2		V	8	5	4	3	2	2	1	1	0	2	79.1	1766	630593
85	1	1M	11	0	13	10	27	29	54	121	87	87	84	54	48	630594
85	1	1M	11	23	23	8	5	3	0	0	1	0	1	.0	28121	630595
85	2	1M	11	0	122	28	23	14	18	32	38	39	35	29	27	630596
85	2	1M	11	7	13	7	4	2	2	2	0	0	0	.0	28121	630597
85	3	1M	11	0	247	159	139	110	55	55	47	61	50	35	31	630598

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85	3	1M11	11	18	5	5	3	1	0	1	0	2	.0	28121	630599
85	4	1M11	0	47	286	333	250	222	190	110	89	85	57	53	630600
85	4	1M11	17	29	7	4	7	2	0	3	0	1	.0	28121	630601
85	5	1M11	0	1	232	529	441	497	411	243	175	116	104	85	630602
85	5	1M11	37	32	18	4	8	2	1	2	1	0	.0	28121	630603
85	6	1M11	0	0	75	495	612	737	741	565	340	216	151	129	630604
85	6	1M11	43	46	13	9	9	1	0	6	1	4	.0	28121	630605
85	7	1M11	0	0	7	199	402	761	896	743	644	416	291	212	630606
85	7	1M11	67	58	19	9	7	4	1	5	2	3	.0	28121	630607
85	8	1M11	0	0	0	45	203	497	742	719	686	469	381	266	630608
85	8	1M11	86	75	16	12	10	6	1	4	0	3	.0	28121	630609
85	9	1M11	0	0	0	8	57	172	430	582	667	458	380	282	630610
85	9	1M11	111	105	34	16	16	4	1	0	0	1	.0	28121	630611
8510		1M11	0	0	0	2	11	53	172	267	426	353	304	295	630612
8510		1M11	128	93	31	30	16	8	1	1	2	4	.0	28121	630613
8511		1M11	0	0	0	0	2	16	84	132	269	200	229	195	630614
8511		1M11	87	85	20	18	13	6	0	0	0	2	.0	28121	630615
8512		1M11	0	0	0	0	1	6	30	54	116	82	116	119	630616
8512		1M11	51	47	16	13	8	5	1	1	2	0	.0	28121	630617
8513		1M11	0	0	0	0	0	2	2	25	39	45	45	47	630618
8513		1M11	31	17	5	5	5	2	0	4	0	1	.0	28121	630619
8514		1M11	0	0	0	0	0	0	3	9	16	12	20	18	630620
8514		1M11	16	22	7	5	3	3	1	2	1	2	.0	28121	630621
8515		1M11	0	0	0	0	0	0	0	3	7	9	12	14	630622
8515		1M11	4	4	2	1	3	2	0	1	1	2	.0	28121	630623
8516		1M11	0	0	0	0	0	0	1	4	3	1	2	3	630624
8516		1M11	3	2	0	2	1	0	1	1	0	1	.0	28121	630625
8517		1M11	0	0	0	0	0	0	0	1	1	1	2	2	630626
8517		1M11	3	0	0	0	0	0	0	0	0	0	.0	28121	630627
8518		1M11	0	0	0	0	0	0	0	0	1	1	1	0	630628
8518		1M11	1	0	1	1	0	0	0	0	0	0	.0	28121	630629
8519		1M11	0	0	0	0	0	0	0	0	1	1	0	0	630630
8519		1M11	1	0	0	0	0	0	0	0	0	0	.0	28121	630631
8520		1M11	0	0	0	0	0	0	0	0	0	0	0	1	630632
8520		1M11	0	2	0	0	0	0	0	0	0	0	.0	28121	630633
8521		1M11	0	0	0	0	0	0	0	0	0	0	0	0	630634
8521		1M11	0	0	0	0	0	0	0	0	0	0	.0	28121	630635
8522		1M11	0	0	0	0	0	0	0	0	0	0	0	0	630636
8522		1M11	0	0	0	0	0	0	0	0	0	0	.0	28121	630637
85	1	2M11	0	23	8	17	21	38	46	35	34	24	13	31	630638
85	1	2M11	10	7	4	1	0	0	0	0	0	1	.0	22477	630639
85	2	2M11	0	286	77	49	27	26	41	28	43	21	20	18	630640
85	2	2M11	8	5	1	0	2	0	0	0	0	0	.0	22477	630641
85	3	2M11	0	224	232	231	135	92	113	66	59	48	35	29	630642
85	3	2M11	8	15	3	2	3	1	0	0	0	1	.0	22477	630643
85	4	2M11	0	12	253	493	372	384	340	190	143	82	77	51	630644

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85	4	2M11	20	16	7	2	1	1	1	1	0	0	.0	22477	630645
85	5	2M11	0	0	104	558	566	634	584	391	320	174	140	83	630646
85	5	2M11	32	34	7	6	4	1	1	0	0	0	.0	22477	630647
85	6	2M11	0	0	13	271	407	676	914	652	532	275	188	157	630648
85	6	2M11	51	60	12	5	2	1	1	3	0	1	.0	22477	630649
85	7	2M11	0	0	2	54	169	507	697	615	638	423	259	231	630650
85	7	2M11	74	58	13	6	6	2	1	0	0	0	.0	22477	630651
85	8	2M11	0	0	0	9	32	193	387	487	541	414	293	261	630652
85	8	2M11	100	81	23	12	7	2	0	2	0	1	.0	22477	630653
85	9	2M11	0	0	0	1	11	58	152	180	374	294	207	242	630654
85	9	2M11	73	64	30	11	5	5	1	2	0	1	.0	22477	630655
8510		2M11	0	0	0	0	3	10	40	90	137	149	139	171	630656
8510		2M11	55	56	25	6	10	9	2	2	2	1	.0	22477	530657
8511		2M11	0	0	0	0	3	6	12	22	55	47	68	73	630658
8511		2M11	37	42	23	5	10	2	0	2	0	1	.0	22477	630659
8512		2M11	0	0	0	0	0	0	1	10	13	19	22	48	630660
8512		2M11	16	15	12	4	6	2	0	1	0	1	.0	22477	630661
8513		2M11	0	0	0	0	0	0	0	1	4	6	7	16	630662
8513		2M11	7	6	5	3	5	1	0	1	1	2	.0	22477	630663
8514		2M11	0	0	0	0	0	1	1	0	0	2	5	5	630664
8514		2M11	2	3	4	4	6	0	0	1	0	0	.0	22477	630665
8515		2M11	0	0	0	0	0	0	0	0	0	1	1	1	630666
8515		2M11	0	0	0	1	1	0	0	0	0	0	.0	22477	630667
8516		2M11	0	0	0	0	0	0	0	1	0	0	0	0	630668
8516		2M11	1	0	1	0	0	0	0	0	0	0	.0	22477	630669
8517		2M11	0	0	0	0	0	0	0	0	1	0	1	2	630670
8517		2M11	0	0	0	0	0	0	0	0	0	0	.0	22477	630671
8518		2M11	0	0	0	0	0	0	0	0	0	0	0	0	630672
8518		2M11	0	0	0	0	0	0	0	0	0	0	.0	22477	630673
8519		2M11	0	0	0	0	0	0	0	0	0	0	0	0	630674
8519		2M11	0	0	0	0	0	0	0	0	0	0	.0	22477	630675
8520		2M11	0	0	0	0	0	0	0	0	0	0	0	0	630676
8520		2M11	0	0	0	0	0	0	0	0	0	0	.0	22477	630677
8521		2M11	0	0	0	0	0	0	0	0	0	0	0	0	630678
8521		2M11	1	1	0	0	0	0	0	0	0	0	.0	22477	630679
8522		2M11	0	0	0	0	0	0	0	0	0	0	0	0	630680
8522		2M11	0	0	0	0	0	0	0	0	0	0	.0	22477	630681

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